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Integrating Naval Surface Fire support into an improved Joint Close Air Support architecture

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INTEGRATING NAVAL SURFACE FIRE SUPPORT INTO AN IMPROVED JOINT CLOSE AIR SUPPORT ARCHITECTURE

by

Amy E. Lindahl

June 2006

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During recent campaigns in Kosovo, Afghanistan and Iraq, increased emphasis has been placed on Close Air Support (CAS) for forces conducting unconventional operations with small, specialized units as well as conventional operations at the brigade or division level. Because of the proximity to friendly troops, the need for successful integration of forces during CAS missions is critical. The effectiveness of the joint forces conducting Joint Close Air Support (JCAS) can be measured by the success or failure of the Command and Control (C2) process. Situations often occur in which forward air controllers (FACs) from one service integrate into the structure of another service, yet still report to their own leadership. Many non-interoperable communications systems are used, further adding to the confusion. This thesis analyzes the effectiveness of current Joint Close Air Support doctrine in providing the guidelines necessary for the warfighter at all echelons to plan, prepare and execute integrated close air support missions seamlessly when operating in a joint environment. Themes which hamper the ability to efficiently employ command and control (C2) to provide close air support to the Ground Combat Commander are examined. Finally, Naval Surface Fire Support is studied to determine its place in the JCAS architecture and where, within that architecture, it should be implemented. The analysis of case studies involving situations in which JCAS was not used effectively revealed that, though there has been significant progress made in revising Joint CAS doctrine, weaknesses still exist. Joint doctrine must keep pace with emerging technology but for that doctrine to remain relevant, warfighters at all levels must know it, use it and provide feedback when it doesn't work so future iterations can mature and flex with the force.

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INTEGRATING NAVAL SURFACE FIRE SUPPORT INTO AN IMPROVED JOINT CLOSE AIR SUPPORT ARCHITECTURE

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During recent campaigns in Kosovo, Afghanistan and Iraq, increased emphasis has been placed on Close Air Support (CAS) for forces conducting unconventional operations with small, specialized units as well as conventional operations at the brigade or division level. Because of the proximity to friendly troops, the need for successful integration of forces during CAS missions is critical. The effectiveness of the joint forces conducting Joint Close Air Support (JCAS) can be measured by the success or failure of the Command and Control (C2) process. Situations often occur in which forward air controllers (FACs) from one service integrate into the structure of another service, yet still report to their own leadership. Many non-interoperable communications systems are used, further adding to the confusion.

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I. INTRODUCTION

A. OVERVIEW

During recent campaigns in Kosovo, Afghanistan and Iraq, increased emphasis has been placed on Close Air Support (CAS) for forces conducting unconventional operations with small, specialized units as well as conventional operations at the brigade or division level. Because of the proximity to friendly troops, the need for successful integration of forces during CAS missions is critical. The effectiveness of the joint forces conducting Joint Close Air Support (JCAS) can be measured by the success or failure of the Command and Control (C2) process. Situations often occur in which forward air controllers (FACs) from one service integrate into the structure of another service, yet still report to their own leadership. Many non-interoperable communications systems are used, further adding to the confusion.

Recent studies have been conducted on CAS and the need for integrated training and updated doctrine. This thesis will focus on these studies and provide recommendations for a standardized JCAS architecture as well as ways in which to integrate naval surface fire support into this architecture.

B. BACKGROUND

Close Air Support has long been used as a counterland mission of U.S. forces. Recent operations in Afghanistan and Iraq have raised the visibility of the effects of Close Air Support in modern warfare.[1] The need for detailed integration to strike the correct targets while avoiding fratricide is what sets Close Air Support apart from other counterland missions.[2] One of the main problems with integrating CAS is the difference in something as simple as the definition. Joint Publication 3-09.3 defines CAS as:

> air action by fixed and rotary-wing aircraft against hostile targets which are in close proximity to friendly forces and which require

[1] Bruce R. Pirnie, et al. Beyond Close Air Support : Forging a New Air Ground Partnership. (California: RAND Corporation, 2005) 3.

[2] Ibid, 12.

> detailed integration of each air mission with the fire and movement of those forces.

Air Force Manual 1-1, "Basic Aerospace Doctrine, states:

> Close air support is the application of aerospace forces in support of the land component commander's objectives. Since it provides direct support to friendly forces in contact, close air support requires close coordination from the theater and component levels to the tactical level operations. Close air support produces the most focused and briefest effect of any force application mission; consequently, close air support rarely creates campaign-level effects.

Army Field Manual 100-5, "Operations," defines CAS as:

> missions supporting land operations by attacking hostile targets close to friendly ground forces. CAS can support offensive operations by attacking hostile targets close to friendly ground forces. CAS can also support offensive operations with preplanned or immediate attacks. All preplanned and immediate CAS missions require timely intelligence information. CAS missions require positive identification of friendly forces [to prevent fratricide] and positive control of aircraft [to attack enemy forces].

The Marine Corps' FMFM 5-41, "Close Air Support," states that:

> the commander uses CAS at the decisive place and time to achieve local combat superiority or to take advantage of battlefield opportunities. An aircraft's three-dimensional mobility and speed provide the commander with a means to strike the enemy swiftly and unexpectedly. Proper planning and timely communication and control are necessary if the aircrew is to be successful.

Joint Pub 3-09.3, "Tactics, Techniques and Procedures for Close Air Support" identifies the Navy's role in CAS as:

> the support of amphibious and land operations with massed firepower, requiring detailed integration with the ground scheme of maneuver. CAS requires close coordination during tasking, planning and execution. CAS is a force multiplier, enabling the supported commander to mass combat power decisively. Traditionally, the Navy has been a provider of CAS, but can be a recipient of CAS as well, in support of Naval operations.

Finally, JP 3-05, "Doctrine for Joint Special Operations" acknowledges CAS's role in SOF by stating:

> Air Force SOF AC-130's train extensively for CAS in support of special operations direct action mission. Also, AC-130's may provide CAS in support of other component commanders. Special operations helicopters provide limited CAS to SOF land and maritime units.

Each definition is unique and tailored to its specific service yet they are all similar. The common thread in the definitions is that each acknowledges the importance of detailed integration and prior planning and each deal with air forces applying combat power to targets in close proximity to friendly forces.

Even though the definitions have similarities, there still exists confusion and differences among the services when discussing what exactly close air support constitutes. When the United States prosecuted Operation Allied Force in Kosovo, counterland attacks were termed CAS even though there were no friendly forces on the ground because the procedures used were most similar to those normally used for CAS.[3] The meaning of words like "proximity", "close" and "support" come into question when services are brought together for the first time in battle. Does their presence in the definition mean that CAS can only be provided when targets are "in proximity" to friendly forces? To take it one step further, how close is "close"? Does the word "support" imply a one-sided relationship? These are some of the details the services have disagreed about since Close Air Support was first used by the United States in the closing battles of World War I and the discussion continues into today's battles in Iraq and Afghanistan.

C. RESEARCH QUESTIONS AND PROBLEM STATEMENT

This thesis will address the following research questions:

— Does JP 3-09.3 "Tactics, Techniques and Procedures for Close Air Support" provide the required guidelines to build the operational architecture necessary for effective CAS?

— What are the enduring themes that hamper our ability to effectively and efficiently employ Command and Control (C2) to provide close air support in support of the Ground Combat Commander?

[3] Pirnie, 44.

— How does Naval Surface Fire Support (NSFS) support JCAS and in which phases of JCAS would NSFS best fit? Once we figure out Naval Surface Fire Support's place in the JCAS architecture, how do we integrate it?

Close Air Support exemplifies "joint" at a tactical level, and lack of adherence to doctrine, confusion with C2 architecture and radio circuits and reluctance to impose the discipline of joint tactics, techniques and procedures leads to ineffective use of this highly versatile arm of U.S. air power.[4] Recent U.S. involvement in Kosovo, Afghanistan and Iraq has shown both successes and failures in the use of Joint Close Air Support. The battlefield has changed and we are no longer employing tactics of conventional warfare. Smaller, specialized units are being employed for military operations that have increasingly assumed the character of counterinsurgency mingled with counterterrorism.[5] Technological advances have increased the tempo of operations and doctrine is not keeping up.

The June 2004 Mission Area Initial Capabilities Document for Close Air Support, drafted by the Marine Corps stated that "the services' doctrine on Close Air Support has not kept pace with joint doctrine. Close Air Support phases of planning, preparation and execution evolved from Joint and Service doctrine but a common thread is lacking between the service and joint pubs."[6]

This thesis will examine case studies in the use of Close Air Support from recent conflicts and attempt to determine which doctrine, if any, was followed, assess the outcome and draw conclusions as to how doctrine might have been integrated more effectively. The thesis will also examine Naval Surface Fire Support and the role it may play in the future of Close Air Support and how it can be integrated into improved Joint Close Air Support doctrine.

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[4] John M. Jansen, et al. " The Tower of Babel: Joint Close Air Support Performance at the Operational Level." Marine Corps Gazette. (March 2003), 33-39.

[5] Pirnie, 32.

[6] United States. JROCM 095-04. Mission Area Initial Capabilities Document For Close Air Support. (Washington: GPO, 2004), 12.

D. METHODOLOGY

This thesis will answer the primary research questions by focusing on recent studies published by Joint Forces Command, the General Accounting Office and others citing the need for improved joint close air support doctrine and procedures. Case studies, after-action reports and lessons learned from recent conflicts in Kosovo, Iraq and Afghanistan will be used to highlight differences in tactics and procedures implemented by the different services. Current service-specific close air support doctrine will be examined to identify gaps in joint doctrine to support or reject the premise that current joint doctrine is not sufficient for successful integration of forces during close air support to fight the types of urban and "unconventional" battles with which our modern military is faced today. Finally, Naval Surface Fire Support will be examined with respect to Close Air Support to assess where this combat power can be integrated into Joint Close Air Support architecture.

E. ORGANIZATION

Chapter II will examine the history of Close Air Support from its inception in World War I to the current battles in Afghanistan and Iraq. This study will place an emphasis on the need for integrated Close Air Support throughout the past 100 years. Chapter II will next look to the future and outline the importance of Joint Close Air Support in the unconventional warfare that will be waged in the coming years. The vision of the military put forth by the National Military Strategy emphasizes full integration, agility and decisiveness. The final section of Chapter II will examine service doctrine. It will identify the Close Air Support role in each service, the procedure for processing Close Air Support and the methods each uses to coordinate support and establish airspace control measures. Chapter II will conclude with a discussion of the similarities and differences between the service doctrines.

Chapter III will provide an analysis of Joint Close Air Support by examining case studies of incidents in which CAS was employed ineffectively, resulting in fratricide or the targeting of non-combatants. These case studies using practices employed in the field will be used as a baseline to determine which doctrine was

being followed when the incidents occurred, service or joint, and investigate whether that doctrine was sufficient guidance for the effective use of Close Air Support. Once that determination is made, recommendations will be made about the actions needed for current joint doctrine to provide the required guidelines to build the operational architecture necessary for effective Close Air Support. This chapter will argue that though the doctrine used by the elements involved in the incidents may have been sufficient, JP 3-09.3 was insufficient guidance for forces operating in a joint environment. Chapter III will also examine JFCOM's role in the development of Joint Close Air Support Doctrine and summarize the changes made in the September 2005 revision of JP 3-09.3 and provide an analysis of the differences between the 2005 revision and the original 1995 version. Chapter III will conclude by identifying gaps and shortfalls in current joint doctrine.

Chapter IV will focus on the surface Navy's contribution to the Joint Close Air Support mission. The type of conflict in which Naval Surface Fire Support is most effective will be examined and it will be argued that there is a place in the Joint Close Air Support architecture for certain elements of NSFS. Advantages and capabilities of specific surface platforms for the employment of CAS will be outlined. Future weapons integration into Joint Close Air Support will be studied, including the use of Tactical Tomahawk, Extended Range Guided Munitions (ERGMs), Electric Rail Guns and UAVs. The chapter will conclude by looking ahead to future surface ships such as DD(X), CG(X) and LCS to determine if NSFS will have a role in the Joint Close Air Support mission.

Finally, Chapter V will provide a summary and discuss further avenues of research for Joint Close Air Support.

II. CLOSE AIR SUPPORT

When asked where the commander of the 3d Attack Group was getting his doctrine, Partridge replied "he was manufacturing it."

- Interview with General Partridge, USAF, 1974

Using aircraft in support of troops on the ground has been a vision of military commanders since the late 19th century. In 1893 Count Ferdinand Von Zeppelin informed the Chief of Staff of the German army that the airship he was building would have the capability to attack fortifications and troop concentrations.[7] Zeppelin would go on to build twenty-one Zeppelin airships, fourteen of which he sold to the German Army and Navy. Zeppelin airships were used for reconnaissance, scouting and bombing during the opening campaigns of WWI but did not achieve notable success. Despite their range, speed and capacity, these airships were especially vulnerable to gunfire.[8] Prior to World War I, aerial bombing was used successfully, though sparingly, by the Italians in the Italo-Turkish War as well by the Bulgarians in the Balkan Wars.[9] Although these incidents were random and conducted because of the initiative of the aviators involved, they ignited an interest in the combat potential of air power which has evolved into Close Air Support (CAS) as we know it today.

A. HISTORY OF CLOSE AIR SUPPORT

1. World War I

Modern CAS can be traced back to the beginning of the 20th century. Doctrine, tactics and combat aircraft all have roots in World War I. The Great War introduced combat aircraft to the Western Front, the first bombing units and tactical reconnaissance aircraft. In 1914, the British Royal Flying Corps

[7] *Kriegswissenschaftliche Abteilung der Luftwaffe, Die Militariuftfahrt bis zum Beginn des Weltkrieges 1814*, 3 Vols (Berlin, 1941), II. Cited by Franklin B. Cooling. Case Studies in the Development of Close Air Support. Washington D.C.: GPO, 1990, 13.

[8] "Zeppelin, Ferdinand, Graf von" Microsoft Encarta Encyclopedia. 2004 ed.

[9] Franklin B. Cooling. Case Studies in the Development of Close Air Support. (Washington: GPO, 1990) 15.

endorsed the offensive use of aircraft in combat. The French Army developed techniques for air-infantry cooperation in 1916 and the Germans made tremendous progress in 1917 by expanding the use of low-flying aircraft in battle, flying in battle formation and creating an air liaison to communicate between air and ground forces.

The U.S. Army Air Corps debuted in battle in France in 1918, as CAS techniques continued to be refined by every country using aircraft in battle. Air units began to follow elaborate air plans in major offenses. The psychological impact of air attacks to ground troops was recognized and infantrymen were given the first written instruction about defense against aircraft in a 1918 German circular. Finally, a distinction was made between direct CAS (used against targets along the front lines) and indirect CAS (used against targets twenty+ miles beyond the front) and the contribution of each to the effort of ground forces.[10] The debate over which is more effective as the primary contribution of combat aircraft continues today.

2. Inter-War Period

By the end of World War I, the contribution of CAS to the combat effort could not be denied. The years between WWI and WWII were spent developing CAS doctrine, refining tactics and techniques in minor conflicts and experimenting with aircraft design against the backdrop of larger airpower development. Combat experience by pilots of this era was limited and the primary role of military aircraft during the post-war period was maintaining order in the colonies of Britain, France and Spain. The manufacture and importation of aircraft by Germany was officially banned by the Treaty of Versailles in 1919 (though the German military continued to develop aircraft underground.) The Russian air force was uprooted by revolution and civil war. For a decade after the Great War, the development of CAS in Europe was seemingly at a standstill.

As stalled as Close Air Support seemed to be across the Atlantic during the 1920's, great strides were being made in the United States. In 1921, the 3d Attack Group was created. As the first organized attack group to form within the

[10] Cooling, 25.

Army Air Service, the 3d Attack Group was instrumental in developing close air support doctrine in the inter-war period. [11] The same year, Boeing built the Army's first combat aircraft, the GA-1, a massive tri-plane with heavy armament and extensive armor protection. [12] Only ten were delivered and were used primarily as training aircraft. As the 1920's came to an end, the U.S. Marine Corps demonstrated the combat potential of CAS in Nicaragua. There, Marine pilots were the first to use dive-bombing against an organized enemy, they were the first to employ air-to-ground communications in combat and they were the first to transport troops and supplies by air.[13] The 1930's was a time of trial and error for Close Air Support tactics with an emphasis placed on indirect attack in most countries. Advances were made in the design of ground attack aircraft. In the early part of the decade, Hitler took power in Germany, kicking off a rapid military expansion in that country including the introduction of the German Air Force, the *Luftwaffe* in 1935. The *Luftwaffe* placed emphasis on interdiction and strategic bombing using a strategy of interservice cooperation that would go on to define Close Air Support in World War II.

3. World War II

World War II was marked by doctrinal disagreements over differing views of the battlefield and the role of air power in combat. At the beginning of the war, strategic bombardment was the top priority of the U.S. Army Air Force (AAF) and Britain's Royal Air Force (RAF) in Europe and close air support was not part of AAF doctrine. In fact in 1941, AAF doctrine was not to attack targets within range of friendly artillery.[14] After two years of war, the need for written guidance was recognized and in 1942, FM 31-35, "Aviation in Support of Ground Forces"

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[11] "Third Operations Group History," Elemendorf AFB. 13 February 2006. <http://www.elmendorf.af.mil/3Wing/Groups/3OG/webdocs/HISTORY.htm>. Accessed March 2006.

[12] "Military Aircraft." Highgallery.Com. <http://www.highgallery.com/military-aircraft-ga-1.html>. Accessed March 2006.

[13] Elizabeth Tierney. "A Brief History of Marine Corps Aviation." Maxwell-Gunter AFB. 13 July 1962. <http://www.au.af.mil/au/awc/awcgate/usmchist/aviation.txt>. Accessed March 2006.

[14] Christopher R. Gabel. "The US Army GHq Maneuvers of 1941" (Unpublished Ohio State University Ph D Dissertation, 1981), 65-67, 70-71, 97-99, 310-313. Cited by B. Franklin Cooling, *Case Studies in the Development of Close Air Support*, (Washington D.C., 1990), 157.

was published. This document led the way for further advances in joint close air support. Later the same year, the first air support command, the U.S. 12th Air Force, was established in North Africa. The 12th Air Force faced the same problems as most units that are newly implemented. Their forces had never trained together before they went into battle and there was little thought given to the doctrinal problems of air forces supporting ground forces. The Ground Commander controlled all support aircraft.[15]

The Allied experience in North Africa emphasized the need for change in doctrine, the role of aircraft in close air support and command and control methods. These experiences highlighted the need for centralized control of air forces. The Allied victory in Tunisia proved that air superiority is a key to successful air support in combat. In 1943, the Allied Air Support Command was established in response to General Eisenhower's order that the Allied Air Forces set up an army support command headquarters collocated with the Allied Ground Forces to coordinate air-ground operations. This was the "first step toward a 'centralized theater control of air' resources."[16] A number of allied commands were established at this time including the Northwest African Tactical Air Force (NATAF), created specifically to support ground operations.

NATAF made a change from 12th Air Force doctrine and gave control of support aircraft to the Air Commander. This change highlighted an argument about the correct use of air power that continues today. Ground Commanders viewed the primary role of air power as the support of ground troops. Air Commanders viewed the primary role of air forces as gaining air superiority, interdiction and finally, close air support. These priorities were implemented by NATAF and laid the doctrinal foundations for the Army's FM 100-20, "Command and Employment of Air Power," published in 1943, which is the basis of modern tactical air doctrine. As the war continued, the experiences between 1943 and 1945 brought about a call to create Joint Close Air Support doctrine.

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[15] Cooling, 155-157.

[16] Ibid, 168.

Amphibious assaults in Italy and Sicily did much to shape the close air support system. Daily meetings were conducted by air and ground leaders to discuss strategy and choose targets for the following day. Close liaison was provided between Army and Tactical Air Commands, maintaining centralized control over air assets. During Operation Overlord in Normandy, once air supremacy was achieved, close air support was provided on a scale previously unknown and played a decisive role in the Allied victory in France. Visible close air support raised morale of Allied troops and had adverse effects on the morale of the enemy as well as reducing their effectiveness by disrupting communication, cohesion and organization. Problems associated with close air support were identified. Pilots had difficulty identifying targets and handling requests for prearranged support. Communications lacked reliability. The air staff was too small to keep track of both ground and air operations and there was a lack of qualified personnel.[17]

In the Pacific, similar lessons were being learned. Air superiority was an absolute requirement and close air support was used well against Japanese lines of communication. Heavy bombers were useful because of their long range. A problem that was not experienced in Europe and had to be overcome was the use of kamikaze pilots. They were more effective for the Japanese than conventional tactics, making interdiction a priority. It became extremely important for Allied air forces to destroy them on their bases, before they got into the air. The ability to learn from combined experiences in the Pacific and European theaters of war contributed to the momentum of the Allies. By the end of 1944 an effective command and control had developed at all levels, joint and combined.

4. Korea

Based on the experiences of the experiences of the Allies in northern Europe the Army refined FM 31-35 “Air-Ground Operations” in 1946 and reiterated the necessity for land power and air power to be equal, the tactical air commander and the ground commander to be collocated in a Joint Operations

[17] Cooling, 264-268.

Center (JOC) and have both commanders answer to a theater commander, who would retain absolute authority over all forces.[18] The effectiveness of the Army Air Corps in World War II emphasized the need for an independent air branch of the armed services.

In 1947, the Air Force became an individual service. Between 1947 and 1950, eight major joint tactical air exercises were conducted in the United States.[19] The publication of the "Joint Training Directive for Air-Ground Operations" resulted from the training exercises in an effort to standardize procedures for interservice utilization of air support. Steps were made in the advancement of close air support during the Korean War. Feedback from the Air-Ground Operations Conference of 1953 showed that the Joint Operations Center (JOC) functioned well. Operations during adverse weather and night-time were improved by the use of electronic indirect guidance. Jet aircraft were introduced and were proven just as accurate as propeller-driven fighter bombers.[20]

At the start of the war in Korea, there was very little inter-service cooperation and there were acute differences between the way the Air Force and the Marine Corps perceived air support. The Air Force preferred interdiction over close air support as the primary weapon against ground forces while the Marine Corps emphasized the need for close air support to ground forces if they were going to maintain momentum. Out of all air sorties flown, seventy-five percent of those were flown by the Air Force. Close Air Support made up only ten to fifteen percent of those sorties, with the Navy and Marine Corps requesting almost all of them.[21] Senior officers in the Army, Navy and Marine Corps proposed changes to the air request/air control system while the leadership in the Air Force thought ground forces had no idea how to effectively use air power.

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[18] Cooling, 347.

[19] Ibid, 349.

[20] Ibid, 394.

[21] Ibid, 395.

The experiences by all U.S. forces widened the gap in the services' opinion of the perceived role of close air support in future wars. After the Korean war ended, the Air Force published AFM 1-2, "United States Air Force Basic Doctrine" promoting the principle of centralized air war and made the Joint Operations Center an all-Air Force agency. The Army and the Air Force could not agree on a joint statement on the role of close air support. Finally, in 1955, the Army announced that the principles in the Joint Training Directive of 1950 were defective and the doctrine was void.[22] As the Cold War heated up, Joint Close Air Support moved to the backburner as the United States prepared for nuclear war.

5. Vietnam

After Korea, Air Force theory of air power was tailored to deal with the worst possible case (nuclear war), with the idea that any lesser situations could be handled with ease. They trained high-performance, tactical fighter-bomber pilots for the multiple roles of counter-air, interdiction and close air support, making them ill-suited for unconventional war and vulnerable to the guerilla tactics encountered in Vietnam. [23] Because of this, between 1955 and 1959, the Army started building up their own air forces and in preparation for conventional warfare. In 1961, the Army called for designated CAS units and special CAS aircraft leading to the recommendation in 1962 by the Howze Board (Tactical Mobility Requirements Board) for the Army to develop new air assault divisions.[24]

Significant issues that blocked any sort of joint consensus on close air support before the outset of the war were 1) command and control, 2) quantitative measures to determine "adequate" CAS, 3) the Army's highly mobile assault division, 4) specially designed CAS aircraft and the Army and the Air Force use of separate systems of air-ground control.[25] Until 1965, strike missions characterized the air contribution to the war. That year CincPAC

[22] Cooling, 399.

[23] Ibid, 413.

[24] Ibid, 415.

[25] Ibid, 416-418.

decreed the primary air mission in Vietnam to be close air support, launching the rapid evolution of CAS in Southeast Asia. In 1966, the Joint Air-Ground Operations System (JAGOS) was established to alleviate the problem of separate systems of air-ground control in the Army and Air Force.[26] JAGOS integrated the two systems of tactical air control, providing the foundation for the single air manager concept. Though the Army and the Air Force continued to disagree on the role of air power in combat, ground commanders in all services were satisfied with the level of close air support they received. Various aircraft were used for CAS and implemented innovative methods for delivering ordnance to targets on the ground. The tactics and methods for conducting night and all-weather CAS continued to evolve.

6. Modern Conflicts

Recent conflicts in Kosovo, Iraq and Afghanistan have shown Joint Close Air Support successes and failures. Since the evolution of Close Air Support in Vietnam, the Army and Air Force had grown apart. Successes were forgotten and correct doctrine was not documented. Differences in equipment, doctrine, attitude and outlook inhibited integration. In Kosovo, continuing difficulties with successfully planning and integrating Close Air Support in a joint environment led to stove-piped and non-interoperable procedures.[27] Debate among the service leaders about the effectiveness of air power alone to force capitulation continued.

Though there were difficulties, technological advances were made. Operation Allied Force employed the first Joint Direct Attack Munition (JDAM) as well as the first Predator UAVs in combat.[28] In Afghanistan, Close Air Support proved to be a spectacular success when used by Special Operations Forces (SOF) against the Taliban. Units of the CIA also utilized Close Air Support when they infiltrated in small teams.[29] Armed Predators were used for the first time in battle. When the U.S. conducted its first large-scale operation in Afghanistan,

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[26] Cooling, 433.

[27] United States, Mission Area Initial Capabilities Document For Close Air Support. 32.

[28] Pirnie, 43.

[29] Ibid, 51.

Operation Anaconda, the services were not well-prepared to handle joint operations. The Air Force refused to allow personnel other than their own controllers to call in strikes. On top of this, they failed to provide enough Terminal Attack Controllers to Army units. Many controllers called for strikes against the same targets and response time was a problem due to technical reasons and strict Rules of Engagement (ROE).[30]

By the time the United States entered Operation Iraqi Freedom, advances were made in the area of Joint Close Air Support. Ground operations were coordinated with air attacks against enemy ground forces in some areas with great success. Sensor-fuzed weapons and cluster munitions using infrared sensing were introduced in combat.[31] Though OIF showed outstanding examples of joint integration in some areas, in others it proved difficult to get aircraft with appropriate munitions on target quickly enough. Weapon loads were often inappropriate. Distrust between pilots and ground forces made target verification time long.[32] These factors, good and bad, have provided us many lessons learned on which to build a successful Joint Close Air Support architecture.

7. Future of Close Air Support

The application of Close Air Support in the future will depend on the conflicts in which the United States is involved. Nation-states are no longer our biggest threat. We face small cells of terrorists and insurgents operating from failed states. Metropolitan areas have become our battlefield. Joint operations are necessary to maximize the combat potential of our smaller, specialized forces.

The National Security Strategy and the National Military Strategy lay the foundations for future military application. The National Security Strategy places an emphasis on protecting our security, laying foundations for future peace and continuing the fight against terror. It outlines two pillars on which these beliefs

[30] Pirnie, 54-60.

[31] Ibid, 67.

[32] Ibid, 71.

are founded; 1) promoting freedom, justice and human dignity and 2) leading a growing community of democracies by confronting challenges. The National Military Strategy provides a guideline of ways and means to protect the United States, highlighting three priorities. First, we need to win the war on terrorism. Second, we need to enhance our ability to fight as a joint force. Finally, we need to transform the armed forces "in stride" by fielding new capabilities and adopting new operational concepts. The National Military Strategy goes on to state that one of the most desired attributes of our strategy is a fully integrated, agile and decisive force. It stresses an "Active Defense in Depth" by merging joint forces with other government agencies, international government organizations, non-government organizations and multinational capabilities.

Through the National Security Strategy and the National Military Strategy, the need for updated and integrated doctrine and training has been highlighted. Technological advances made by one service must be implemented by all services. Close Air Support has proven to be an effective means of fire support for Special Operations Forces and other specialized units. As the conduct of war continues to change, enemies will operate outside of our Rules of Engagement and international law. Our current threat is not that of a nation-state but of terrorists and insurgents who will be difficult to distinguish from the civilian population. Smaller, specialized units and precision munitions will be needed to combat these threats. An effective system of Joint Close Air Support will provide them the heavy artillery and support needed to conduct successful operations.

B. SERVICE DOCTRINE

The Initial Capabilities Document for Close Air Support was directed by Joint Forces Command in 2004 to increase interoperability and joint effectiveness in the Close Air Support mission area. It points out the deficiency of service doctrine in keeping pace with joint doctrine and highlights several instances in which fratricide was committed by Close Air Support aircraft. The need for the services, the warfighting COCOMs and the Joint Staff to have one accepted CAS doctrine is emphasized by the ICD. Once accepted, the doctrine

must be exercised and tested.[33] This section will examine service doctrine and conclude by identifying gaps and shortfalls between service and joint doctrine.

1. Army/Air Force Doctrine

The Army and the Air Force have partnered together to provide air power to ground forces since the inception of Close Air Support in World War I. This partnership hasn't always been a happy one. Differences in attitudes between airmen and soldiers often caused strife and malcontent between the services. Early airmen thought the most effective use of air power was deep strikes against enemy centers of gravity and viewed Close Air Support as something to be performed only under extreme conditions.[34] Soldiers on the ground have often thought of Close Air Support as a means of maintaining momentum for ground forces and filling temporary firepower shortfalls during intense combat. The integrated force of the future will require the Army and the Air Force to work together as a cohesive unit. Current CAS connectivity is shown in Figure 1.

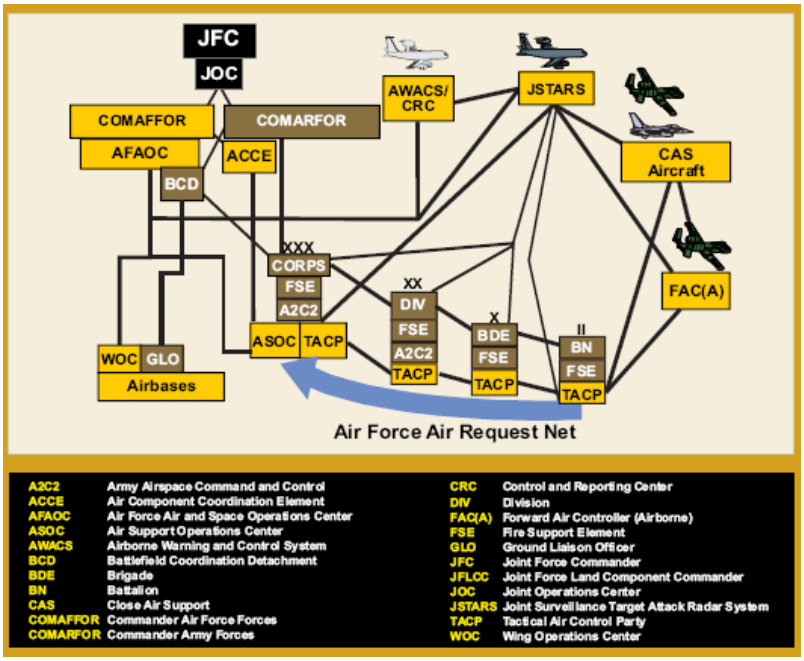

Figure 1. Army/Air Force CAS Connectivity (From JP 3.09-3)

[33] United States. Mission Area Initial Capabilities Document For Close Air Support. 33-34.
[34] Pirnie, 2.

Currently, the Army and Air Force exercise C2 over assigned forces through the Theater Air Control System (TACS). The TACS provides the commander, Air Force forces (COMAFFOR) the capability to conduct joint air operations. The Air Component Commander exercises this control through the Air Force air and space operations center (AFAOC), the senior element of the TACS.[35] The AFAOC allocates resources and tasks forces through air tasking orders (ATOs). The air component coordination element (ACCE) is established by the AFCC and is the senior liaison element to interface with the joint force land component commander (JFLCC) or commander, Army forces. The wing operations center (WOC) provides C2 of unit forces and uses the ATO to generate sorties for the accomplishment of CAS missions. The Airborne Warning and Control System (AWACS) and the Joint Surveillance Target Attack Radar System (JSTARS) are the airborne C2 platforms supporting CAS.[36] The control and reporting center (CRC) provide the COMAFFOR a decentralized C2 execution capability connecting lateral and subordinate C2 nodes to the joint air operations center (JAOC).

The coordination and execution of Close Air Support missions in support of Army operations is controlled at the Air Support Operations Center (ASOC). The ASOC processes Army requests for immediate Close Air Support. The ASOC tasks on-call missions or diverts scheduled missions to satisfy approved immediate requests.[37] The Battlefield Coordination Detachment (BCD) is the senior Army airspace command and control element. It is collocated with the AOC. Preplanned CAS requests are forwarded to the BCD.

At each level in the Army, there are elements which conduct, synchronize and coordinate close air support. The Tactical Operations Center (TOC) plans and synchronizes all operations including planning and requesting CAS for unit missions. The Tactical Command Post (TCP) is the approving authority for

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[35]United States. Joint Chiefs of Staff (JCS). Joint Tactics, Techniques, and Procedures for Close Air Support (CAS). (Washington: GPO, 2005) II-3.

[36] Ibid, II-5.

[37] Ibid, II-7.

immediate CAS requests or diversions of preplanned missions for the unit and the Fire Support Element (FSE) controls all fires and coordinates the use of airspace within the unit.[38] Terminal control of Close Air Support is the final step in CAS execution. There are both air and ground elements to accomplish this mission. Tactical Air Control Parties (TACPs) are Air Force liaison elements and have the primary responsibility of terminal control. Air Liaison Officers (ALOs), Terminal Attack Controllers (TACs), Forward Air Controllers (FACs), Tactical Air Coordinators (TAC[A]) are all members of the TACP and advise on CAS employment, control aircraft in close air support of ground troops and perform terminal control functions. The Fire Support Team (FIST) coordinates ground fire support as well as CAS and naval resources through appropriate agencies at the company level and assist in the execution of CAS.[39]

2. Navy/Marine Corps Doctrine

Marine Corps Close Air Support doctrine is unique. What sets it apart from other services doctrine (or lack thereof) is that Marines like it. The doctrine and tactics work for them because it is Marines working with Marines. Marines speak the same language and have the same mission. Marine Air is an integral, irreplaceable part of the Marine Air-Ground Team and operates under the premise that Marines provide the best CAS for themselves.

The Marine Air-Ground Task Force (MAGTF) team is task-organized to successfully perform its mission as a self-contained package of maneuver force, firepower, air support, lift and sustainment.[40] The Navy integrates close air support by training with SEAL teams and Marine TACPs regularly and includes JCAS training in pre-deployment workups. The amphibious force has figured out the importance of CAS and has successfully integrated it into their architecture. Current Navy/Marine Corps CAS connectivity is shown in Figure 2.

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[38] United States, JP 3-09.3, 2005, II-9.

[39] Ibid, II-10.

[40] Mark J. Gibson. "USMC Close Air Support Must Be Complementary, Not Competitive." Globalsecurity.org. 1995. <http://www.globalsecurity.org/military/library/report/1995/GMJ.htm>. Accessed April 2006.

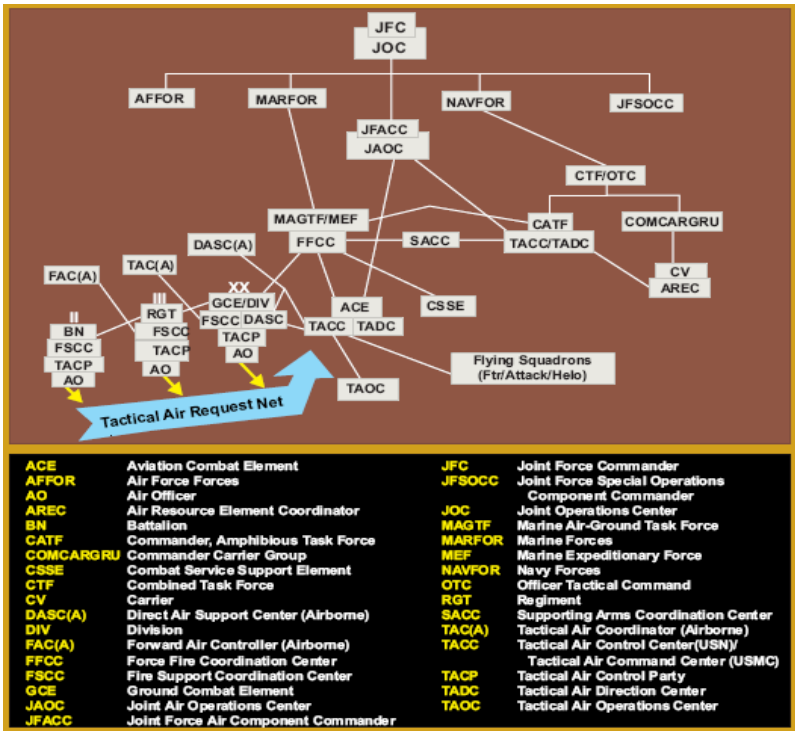

Figure 2. Navy/Marine Corps CAS Connectivity (From JP 3-09.3)

Naval CAS is conducted through the Naval Theater Air Control System (NTACS). This system is comprised of the tactical air control center (TACC), the primary air control agency from which all air operations are controlled, the tactical air directions center (TADC), the control agency subordinate to the TACC and the helicopter direction center (HDC), an air operations installation from which control and direction of helicopter units are exercised. The air traffic control section (ATCS) and the air support coordination section (ASCS) provide safe passage, radar control and surveillance and coordinate and control overall CAS employment, respectively.[41]

The Marine air command and control system (MACCS) provides command and control to the MAGTF aviation combat element (ACE) commander. The tactical air command center (TACC) acts as the operational command post for the ACE commander. The Marine TADC is subordinate to the Navy TACC. The Tactical Air Operations Center (TAOC) and the Direct Air Support Center (DASC) provide the same functions for the Marine Corps units as

[41] United States, JP 3-09.3, 2005, II-11.

the ATCS and the ASCS provide for Naval units. The tactical air control party (TACP) is located within the ground control element (GCE) and provides a way for ground commanders to access MACCS to satisfy direct support requirements. A Forward Air Controller heads the TACP, which has two FAC parties that accompany front-line companies. The FAC advises the ground unit commander on CAS employment while controlling CAS aircraft and maintaining radio comms. The TAC(A) and the FAC(A) provide airborne control for CAS missions.[42] The TAC coordinates the action of combat aircraft engaged in close support of ground or sea forces. The FAC controls close air support aircraft. Coordination between the MACCS and the force fires coordination center (FFCC) and the fire support coordination center (FSCC) is required to integrate fire support assets and maneuver to achieve desired results from the air without affecting the scheme of maneuver on the ground. When the services conduct amphibious operations, elements of both systems are used. The Navy TACC will normally be responsible for controlling aircraft operations within the airspace until command and control of aircraft and missiles is phased ashore.[43]

3. Special Operations Forces Doctrine

Special operations forces have a unique need for close air support because they are small, light units, deployed deep into hostile territory for a variety of missions including direct attack, search and recovery and special reconnaissance. Their only means of heavy fire support comes from fast-moving close air support assets. The ability of the individual services to provide them with the timely CAS they require hinges on the proper allocation of CAS assets to SOF in the planning process.

Special operations fall under the control of the joint forces special operations component commander (JFSOCC). The special operations liaison element (SOLE) coordinates, deconflicts and integrates SOF air and surface operations. The SOLE processes all CAS requests in the JAOC. The special operations command and control element (SOCCE) is the liaison for SOF units

[42] United States, JP 3-09.3, 2005, II-13-II-14.

[43] Ibid, II-15.

when they are operating in support of a conventional joint or surface force. Special operations forces employ individuals from all the services who are JTAC qualified to perform terminal attack control.[44] Special Operations CAS connectivity is shown in Figure 3.

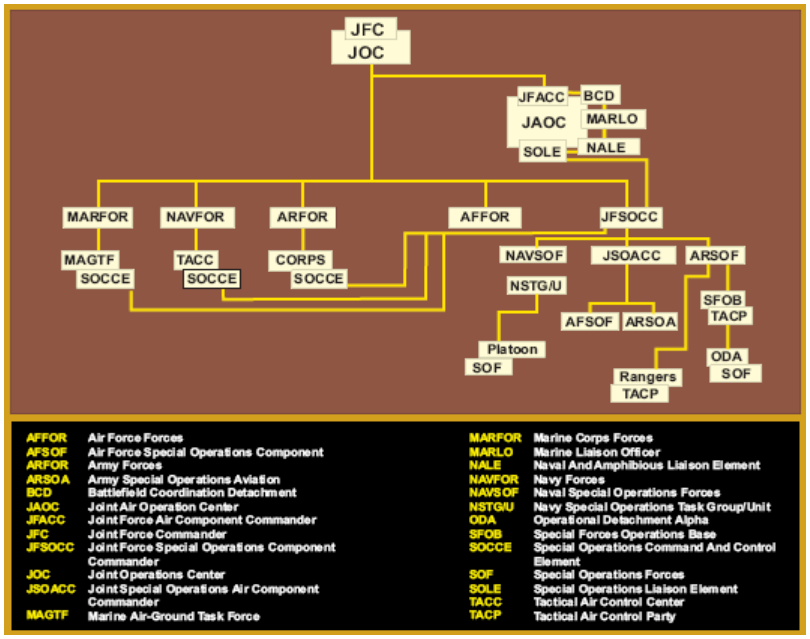

Figure 3. Special Operations CAS Connectivity (From JP 3-09.3)

C. CONCLUSIONS

JP 3-09.3, Joint Tactics, Techniques and Procedures for Close Air Support, was revised in September, 2005 and lays the foundation for the successful integration of close air support at the joint level. In the joint fighting force of the future, it will be necessary for services to train and adhere to joint doctrine. There is no place for service bias in a successful air-ground battle. Some would argue that the Army is adverse to close air support because the perception is there that Army Commanders feel they must be able to win the battle without air, stemming from a long-standing distrust between the Army and the Air Force in the conduct of close air support.[45]

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[44] United States, JP 3-09.3, 2005, II-15-II-17.

[45] Arden B. Dahl. "Joint Close Air Support Turning a New Joint Leaf." National Defense University. February 2003. <http://www.ndu.edu/library/n4/n03ADahlJointAir.pdf>, 26. Accessed April 2006.

Historical doctrine has shown that close air support has not been a primary mission for the Air Force, preferring the more “glamorous” missions of air interdiction and strategic attack to the close air support to troops on the ground. This has done nothing to improve the CAS relationship between the Army and the Air Force. The Navy has recently integrated JCAS missions into their air wing training schedules and every unit trains for the mission.[46] The Marines have found a formula for success in the employment of CAS. Marine pilots understand that their objective is to support the troops on the ground in the accomplishment of the overall mission. They put a premium on CAS and make it a priority. The troops on the ground understand this so the trust is there. Special Operations Forces rely heavily on CAS. They travel light and depend on close air support to be there for them when they need it. Close air support may not be a primary mission of the Army or the Air Force but when it is called for, these two services have to be willing to put their biases aside and integrate as one joint unit to accomplish the mission at hand.

[46] Dahl, 22.

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III. ANALYSIS OF JCAS

> I take my system, my targeting pod and I make several passes over these vehicles to ensure they are in fact military vehicles. I roll in on two passes to get a close look, both with my eyeballs and with my targeting pod, IR (infrared) picture, and at this point it's about 25 minutes into building the whole picture of the destruction that is falling from north to south into the town of Djakovica, and I make a decision at that point that these are the people responsible for burning down the villages that I've seen so far. I go in, put my system on the lead vehicle and execute a laser-guided bomb attack on that vehicle, destroying the lead vehicle. —Text of recorded comments by the unidentified pilot of a NATO plane involved in the bombing of a convoy in Kosovo, from tape played during media briefing at NATO headquarters as transcribed by the Associated Press.[47]

Successful integration of Close Air Support between the services requires trusting relationships between key players in the planning process as well as the execution. The need for detailed integration requires personnel from many different communities to work closely together to achieve superior situational awareness and optimal employment of Close Air Support assets in support of the troops on the ground. Areas for deconfliction of CAS are shown in Figure 4.

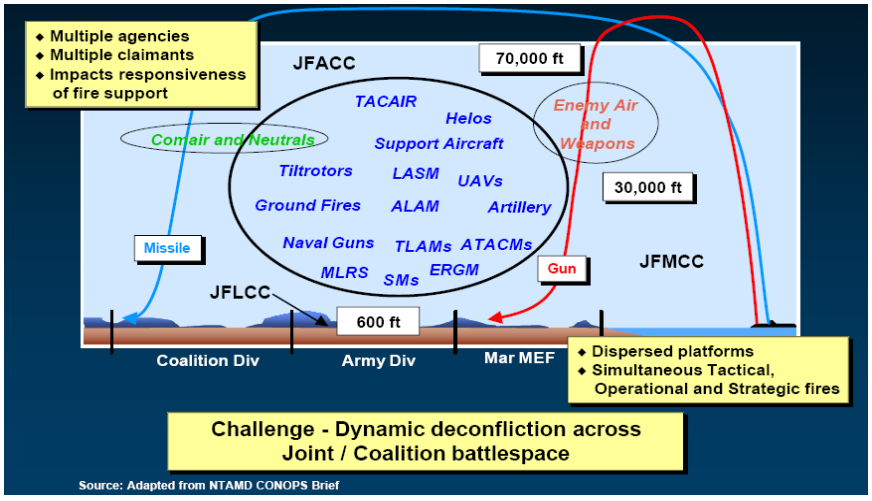

Figure 4. Deconfliction of the JCAS Battlespace (From NTAMD CONOPS Brief)

[47] "Comments From Pilot Involved in the Bombing of Convoy." JSOnline.com. 25 April 1999. <http://www2.jsonline.com/news/kosovo/apr99/0416pilot.asp?format=print>. Accessed April 2006.

Command and control, intelligence and air assets available are only a small number of the many factors Close Air Support planners must take into consideration when planning for CAS in a joint environment.[48] Service bias also becomes an important consideration when bringing individuals together for CAS planning. Doctrine from each service regarding the employment of Close Air Support sometimes conflicts. This disconnect can lead to ineffective employment of high demand/low density air assets.

JP 3-09.3, Joint Tactics, Techniques and Procedures (TTPs) provides the doctrinal basis for Joint Close Air Support operations. Its guidance is authoritative and takes precedence over service publications if conflicts arise.[49] For that reason, it is imperative that each service train to the tactics, techniques and procedures set forth in this doctrine and employ them on the battlefield. Successful adoption of these TTPs will lead to transparent integration of forces on the battlefield, regardless of service. Unsuccessful adoption of the TTPs set forth in JP 3.09-3 will lead to ad hoc procedures, confusion, ineffective fires and worst case, fratricide.

This chapter will examine case studies from recent conflicts in which CAS was used ineffectively and use those cases to determine which doctrine (if any) was followed and what effect doctrine may have had on the outcome of the mission. For the purposes of this paper, the joint doctrine examined in each case will be the doctrine in effect for all three cases, the original JP 3-09.3, dated December 1995. A discussion of the updated JP 3-09.3 will be included later in this chapter. Cases involving fratricide and the bombing of non-military targets while conducting CAS will be examined to determine if the doctrine followed, service or joint, contributed to the ineffective employment of CAS assets.

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[48] United States. Joint Chiefs of Staff (JCS). Joint Tactics, Techniques, and Procedures for Close Air Support (CAS). (Washington: GPO, 1995) xxi.

[49] Ibid, i.

A. CASE STUDIES

1. Incident on the Djakovica-Prizren Road, Kosovo on 14 April 1999

On 14 April 1999, NATO aircraft targeted a convoy of over 1000 Albanian refugees on the Djakovica-Prizren Road three times, killing approximately seventy-three civilians and reportedly injuring up to 100. NATO aircraft were patrolling the area at an altitude of 15,000 feet, searching for Serb military forces conducting ethnic cleansing operations in the area. The convoy was bombed three times, the F-16 pilots mistaking the civilian cars, tractors and carts for Yugoslav Army and Special Police troop carrying vehicles.

NATO claimed that from the attack altitude, the vehicles in the convoy appear to be military vehicles. There were reports of Serb forces using civilian vehicles for troop transport as well as intermixing military vehicles with civilian convoys along the road between Djakovica and Prizren. The Combined Forces Air Component Commander (CFACC), General Michael Short, put out the guidance that military vehicles intermingled with civilians were not to be attacked. The UN tribunal investigating the incident stated they did not believe the civilians to be deliberately attacked although the substantial altitude and speed of the aircraft, the assumption that the intended targets were legitimate military targets combined with the fact that the pilot was also acting as the FAC(A) contributed to the attack.[50]

This case study from the Kosovo campaign was used because, though it was not considered CAS in the traditional sense, it was termed CAS in Operation Allied Force by NATO planners. The element of the CAS definition regarding "proximity to friendly forces" is irrelevant in this case because the incident described does not necessarily demonstrate a breakdown in the operational CAS architecture used by ground and air forces at the execution level but rather a breakdown in the process at the strategic level in the planning phase. The

[50] "Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign Against the Federal Republic of Yugoslavia." UN.org. <http://www.un.org/icty/pressreal/nato061300.htm>. Accessed April 2006.

complexity of the civil-military relations in the target nomination and approval process contributed to friction between the U.S. military and NATO leadership.

In Kosovo, airpower was used independent of ground forces to accomplish the strategic objective of ending the attacks on Kosovar Albanians.[51] It was argued that "the U.S. and NATO entered the conflict without a sound strategy" to prevent ethnic cleansing, achieve peace and provide a democracy for the Kosovar people.[52] There was doubt that airpower alone would be enough to achieve the objectives. Military planners were constrained in their target selection by pressure from NATO civilian leadership to avoid a prolonged conflict with Serb forces, limit collateral damage and maintain a favorable international opinion.[53] The constraints in target selection caused military leaders to modify doctrine.

Air Force Doctrine Document 2-1.3, Counterland states that "air superiority is required for CAS missions to concentrate on the task at hand. CAS is highly demanding of aircrew situational awareness, and proper execution of the CAS mission is not normally possible while searching for, or reacting to, enemy air threats. A strong counterair plan early in the campaign will therefore enable more effective close air support. Suppression of enemy air defenses is part of the counterair function and is perhaps the most important aspect of air superiority to the CAS pilot." Because of time constraints driven by the ethnic cleansing, there was not enough time for the suppression of enemy air defenses, causing pilots to drop bombs from higher altitudes and making identification difficult and collateral damage more likely.[54] Lt. Col Paul Strickland, a member of the CAOC staff

[51] Richard A. Hand. "Who Should Call the Shots? Resolving Friction in the Targeting Process," *School of Advanced Airpower Studies Air University*, Maxwell AFB, Alabama, June 2001, 52.

[52] Doug Thompson. "Miltary Strategists Admit Failure in 'Unwinnable' Kosovo Air War," http://www.capitolhillblue.com/March1999/0331199/cruisemissiles033199.htm, accessed January 2000. Cited by Richard Hand, "Who Should Call the Shots? Resolving Friction in the Targeting Process," *School of Advanced Airpower Studies Air University*, Maxwell AFB, Alabama, June 2001, 53.

[53] Interview with Maj. Michael V. Smith by Richard A. Hand, 28 May 2001. Cited by Richard Hand, "Who Should Call the Shots? Resolving Friction in the Targeting Process," *School of Advanced Airpower Studies Air University*, Maxwell AFB, Alabama, June 2001, 57.

[54] Ibid, 60.

during Operation Allied Force argued that the CAOC was unable to produce a timely and accurate ATO, caused by the absence of doctrinal guidance for the targeting and approval process.[55]

By reviewing this incident, this thesis is using the practice in the field as a baseline to determine if there were doctrinal deficiencies that hampered the effective employment of JCAS. Did JP 3-09.3 provide the guidelines necessary for the effective employment of CAS? Since this was primarily an Air Force prosecution, Air Force doctrine was used as the basis for air operations during Operation Allied Force. There was no NATO doctrine regarding the procedures for target selection. Would JP 3-09.3 have provided the required guidelines to build the operational architecture necessary for the effective employment of air assets during Operation Allied Force? The following discussion attempts to answer this question.

It is the intent of this thesis to determine the enduring themes encountered in this incident that hampered the effective and efficient employment of command and control to air forces during air operations in Kosovo. The original version of JP 3-09.3, approved in December 1995, outlines the considerations associated with CAS employment planning in the joint environment. It stresses the importance of phasing to assist commanders in defining requirements in terms of forces, resources and time. It highlights weather as a significant factor impacting the effectiveness of CAS aircraft and stresses that planners at every level understand the impact of weather on the mission. The air strikes in Operation Allied Force were interrupted several times due to weather, as April is typically a month of rainfall in the region.

JP 3-09.3 also highlights the importance of considering the element of time in coordinating events and massing fires. It states that there must be adequate time available to ensure mission success. In the Balkans, operations were compressed by the urgency to stop the ethnic cleansing Serb forces were

[55] Paul Strickland. "USAF Aerospace Doctrine: Decisive or Coercive?" Air Power Journal, Fall 2000, p 23. Cited by Richard Hand, "Who Should Call the Shots? Resolving Friction in the Targeting Process," *School of Advanced Airpower Studies Air University*, Maxwell AFB, Alabama, June 2001, 64.

conducting on the ground. The original version of JP 3-09.3 listed the nine conditions for effective close air support as 1) air superiority, 2) suppression of enemy air defenses, 3) target marking, 4) favorable weather, 5) prompt response, 6) aircrew and terminal controller skill, 7) appropriate ordnance, 8) communications and 9) command and control. In Operation Allied Force, at least four of the nine conditions were not fully satisfied.

Finally, JP 3-09.3 outlines the responsibilities of the Joint Force Commander to establish guidance and priorities for CAS in the CONOPS, or campaign plans. In this operation, the Joint Force commander was not granted full autonomy over target selection. After Djakovica-Prizren Road, the leaders of France, Britain and the U.S. demanded target veto authority.[56] The requirement for targets to be approved through the President severely affected the timeliness of the strikes.

In this operation, the restrictions imposed on military commanders by the civilian leadership from the coalition countries severely impacted the target selection process. The effectiveness of airpower was hampered by the requirement for consensus among the coalition leadership in this incident and throughout the entire operation. JP 3-09.3 did not provide required guidelines to build the operational architecture necessary for effective CAS, although, had it been followed, it may have provided more effective guidance to the CAOC staff for targeting guidance and approval.

2. Incident in the Shahikot Valley, Afghanistan on 2 March 2002

On 2 March 2002, CWO2 Stanley Harriman, an Army Green Beret, was killed as Operation ANACONDA was launched in the Shahikot Valley region of Afghanistan by gunfire from an AC-130H (SPECTRE) gunship. The AC-130 was providing escort and reconnaissance for Harriman's ground convoy when it broke contact to respond to calls for CAS from other ground units. CWO2 Harriman's unit separated from the main convoy to proceed to a pre-planned position. When

[56] "Bombing by Committee," Balkan Crisis News, 20 September 1999, http://www.refugees.new/en/daily/pr990920.html, accessed January 2001. Cited by Richard Hand, "Who Should Call the Shots? Resolving Friction in the Targeting Process," *School of Advanced Airpower Studies Air University*, Maxwell AFB, Alabama, June 2001, 65.

the AC-130 returned to the convoy, the crew of the gunship miscalculated their own position relative to the ground and believed CWO2 Harriman's unit to be enemy vehicles and personnel positioned to attack the convoy. They requested permission to engage, received permission and fired multiple rounds into CWO2 Harriman's unit, killing Harriman and two Afghan military personnel and injuring three U.S. and 14 Afghan soldiers.[57]

An investigation into this incident was ordered by the Commander of USCENTCOM, General Tommy Franks, after he noticed that Harriman's unit was radioing that they were under fire at the same time the AC-130 was engaging the "enemy" on another radio circuit. The results of the investigation found that the crew of the AC-130 had misidentified their location based upon visual observation of ground reference points after experiencing equipment problems with their navigation system. Based on this inaccurate fix, they were observing a grid point that was north of the grid point they were requested to observe by the convoy. They spotted Harriman's element within that grid point vicinity and identified it as enemy forces positioned to attack the main convoy. They requested permission to engage and received it, based on their inaccurate fix of their own position. When Harriman's element reported receiving mortar fire, the AC-130 broke off to support the element and moved to the North, to the location they believed Harriman to be.[58]

A number of questions come into play when studying this incident, the details of which are still classified. Who was controlling the aircraft? How many terminal attack controllers were attached to the convoy and with which elements were they located? It was reported that every 12-man Special Forces A team had a controller, as did SEAL teams, members of the 10th Mountain Division and CIA operators. All told, there were said to be 37 terminal attack controllers in the

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[57] "Results of Investigation into Death of U.S. Service Member." Globalsecurity.org. 8 November 2002. <http://www.globalsecurity.org/military/library/news/2002/11/mil-021108-centcom01.htm>. Accessed April 2006.

[58] Ibid.

Shahikot Valley.[59] One report stated that CWO2 Harriman was listening on the radio as the AC-130 described the "enemy" convoy. He heard the AC-130 describing what they saw, how many vehicles in the convoy, and Harriman radioed over to the other controller: 'You are describing us. You're describing us.'[60] If this is the case, it stresses the importance of reliable communications between all units, air and ground, as well as the significance of having a sound communications plan that ensures the deconfliction of all radio nets.

The crew of the AC-130 did not face disciplinary action for their mistake and it is not the intent of this thesis to place blame on any person or crew involved in this incident. By reviewing this instance of fratricide, the practice in the field is being used as a baseline to determine if there were doctrinal deficiencies that hampered the effective employment of JCAS. Did JP 3-09.3 provide the guidelines necessary for the effective employment of CAS? The questions presented above highlight the shortcomings of JP 3-09.3 as the sole doctrine when conducting JCAS. It is unclear from which doctrine the forces in the Shahikot Valley were operating at the outset of Operation Anaconda. What is clear is that the Tactics, Techniques and Procedures for Joint Close Air Support alone, published in December 1995, did not provide the architecture necessary for the successful integration of forces in the employment of JCAS in this incident.

The architecture for CAS for special operations forces is outlined in general terms in JP 3-09.3. The problems encountered in this incident did not seem to be problems with the command structure but more problems with the control structure, specifically, communications and navigation. JP 3-09.3 states that "CAS-capable units and aircrews will need radio frequencies and call signs for the airspace control agencies and the terminal controllers they will need to

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[59] Joe Pappalardo. "Afghanistan Taught U.S. 'Hard Lessons' In Close Air Support." NationalDefenseMagazine.org. August 2005. <http://www.nationaldefensemagazine.org/issues/2005/aug/afghanistan_taught.htm>. Accessed April 2006.

[60] David Martin. "Friendly Fire." 60 Minutes II. 12 March 2003. <http://www.cbsnews.com/stories/2003/03/12/60II/printable543777.shtml>. Accessed April 2006.

contact during the course of their missions."[61] If the report of Harriman hearing the description of the "enemy" and calling to another controller that they were identifying his element, the two primary players in this incident did not have the means available to communicate effectively. The navigation error by the AC-130 crew was the source of the confusion in this incident and was found to be the primary cause of the accident. The use of terrain features is the technique the AC-130 crew used to identify their position because of the problems they had been having the entire mission with their navigation systems. This technique is recommended by JP 3-09.3 as a method to identify control points (in this case terrain features, which they misidentified) for the deconfliction with other fires. The pub stresses the importance of basic pilotage and navigation skills in CAS due to the "fog of war, " stress, confusion and other factors that may complicate the tactical situation for CAS aircrews.

In this incident, it appears that many of these factors contributed to an honest mistake that led to this tragic incident. Though the AC-130's reported position was wrong, the question remains, why wasn't Harriman's unit identified as a "friendly?" JP 3-09.3 specifically addresses night CAS using AC-130 gunships because of their ability to provide accurate support for extended periods of time to ground units in a night time environment. It highlights the GLINT (gated laser intensifier) as part of the LLLTV (low light level television) as an alternate source of IR illumination with the capability to illuminate and identify IR GLINT tape worn by friendly ground forces. A drawback to GLINT is that it highlights the aircraft to enemy forces using night vision devices. [62] It was reported that CWO2 Harriman's element was wearing the GLINT tape on their persons and their vehicles.[63] If that was the case, it is assumed in this incident that the crew of the AC-130 was not utilizing their GLINT technology. The original version of JP 3-09.3, published in September of 1995, did not require AC-130 aircraft to utilize this technology and cited other methods for identifying

[61] United States, JP 3-09.3, 1995, II-15.

[62] Ibid, IV-20-21.

[63] Martin.

friendly positions as beacons, IR or visible light strobes, chem lights and other light sources. It is unclear whether Harriman's element or the AC-130 were utilizing any of these techniques. JP 3-09.3 states that marking friendlies is the least desirable method of providing a target mark, although in this case it may have prevented the incident.

The cause of this incident, according to the press release by CENTCOM in November 2002, was the AC-130's inaccurate fix of their own position. The press release stated "after ensuring that there were no friendly forces at the grid point they believed they were observing, the AC-130 received permission to engage the 'enemy'."[64]

Because of their ability to provide accurate CAS in low-light and adverse weather conditions, basic tactics, techniques and procedures for CAS are provided for AC-130 aircrews in JP 3-09.3. The position of friendly forces is stressed in every phase of CAS for the AC-130. Upon arrival, the AC-130 crew is to contact the terminal controller for ingress instructions. It seems as though the AC-130 crew was in contact with the command center but were they in contact with the forces on the ground? According to JP 3-09.3, the AC-130 crew will also make every effort to establish radio contact to speed acquisition of friendly positions and authenticate the terminal controller. A detailed threat description, marking of friendly locations, identifiable ground features and the ground commander's willingness to accept "danger close" (ordnance delivery inside the 0.1% probability of incapacitation) are mandatory briefing items for the AC-130. In the fast-paced, fluid environment in the Shahikot Valley during Operation Anaconda, all friendly locations may not have been marked. For the attack phase, the first consideration for the AC-130 is to identify friendly position. JP 3-09.3 stresses that "the AC-130 crew will maintain radio contact with the ground forces at all times during firing."[65] In this case, it can be assumed that

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[64] "Results of Investigation into Death of U.S. Service Member." Globalsecurity.org. 8 November 2002. <http://www.globalsecurity.org/military/library/news/2002/11/mil-021108-centcom01.htm>. Accessed April 2006.

[65] United States, JP 3-09.3, 1995, V-38.

the AC-130 crew was in contact with forces on the ground, although it does seem as though CWO2 Harriman's element was not one of them.

In this operation, the lack of communications between forces on the ground (specifically CWO2 Harriman's element) and the AC-130 was a primary contributor to this incident. The effectiveness of the close air support provided by the AC-130 was hampered by the inaccurate fix of their own position, coupled with the "fog of war." Although CWO2 Harriman's element was positioned according to the scheme of maneuver, they were still confused with enemy forces. JP 3-09.3 did provide guidelines for the employment of close air support in this instance but those guidelines were not specific enough to build an effective operational architecture. Lack of communications is a major theme in our ability to effectively and efficiently employ C2 to provide close air support in support of the Ground Combat Commander. A primary factor in this incident was the inability of the aircrew to communicate with Harriman's element and identify them as friendly. Devices that connect ground and air forces with the same picture and allow them to share photos, images and electric pen markings in near real time will be important tools for effectively employing close air support.[66]

3. Incident near An Nasiriyah, Iraq on 23 March 2003

On 23 March 2003, at least ten U.S. Marines were killed and four injured near An Nasiriyah by a U.S. A-10 when it targeted their company and made multiple firing passes against their position. The Marines were a part of a Battalion assigned the mission of securing two bridges over the Euphrates River and the Saddam Canal. The Battalion consisted of Bravo Company, the Forward Command Post, Alpha Company and Charlie Company.[67] Bravo Company led the offensive across the southern bridge then maneuvered off the main road to avoid the threat of enemy fire in "Ambush Alley" and got stuck in muddy conditions in the eastern section of the city. The Forward Command Post also got stuck.

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[66] Pappalardo.

[67] "Results of Investigation into Death of U.S. Service Member." Globalsecurity.org. 8 November 2002. <http://www.globalsecurity.org/military/library/news/2002/11/mil-021108-centcom01.htm>. Accessed April 2006.

Due to communications problems throughout the Battalion, Charlie Company mistakenly thought Bravo Company had moved straight up Ambush Alley and seized the northern bridge. Charlie Company crossed the southern bridge and attempted to maneuver through Ambush Alley to the northern bridge when they began to take heavy fire. Charlie Company proceeded to the northern bridge and seized it while at the same time, taking the lead. The Charlie Company Commander called the Battalion Commander, located with the Forward Command Post to notify them of their position. After a lull in enemy fire, Charlie Company again began taking heavy enemy fire.[68] At the same time, the Air Officer in the Forward Command Post called the FAC, located with Bravo Company, requesting CAS to combat enemy forces attacking their location.

A two-ship formation of A-10's were called to engage targets north of the canal. The A-10's spotted a damaged Charlie Company amphibious assault vehicle (thought to be an enemy vehicle) and reported it to the FAC, who saw the smoke and verified it was in the target area. The FAC was unable to see the A-10s or a specific target. The Bravo Company Commander unsuccessfully attempted to verify friendly forces' positions and, based on the scheme of maneuver, identified his company to be the lead element and believed only enemy forces were ahead. The FAC informed the A-10s there were no friendly forces north of the bridge and they were cleared to engage.[69]

Many factors contributed to the clouded situational awareness in this incident including deviations from the planned scheme of maneuver, the urban environment and problems with communications links. The central cause of the incident was found by the Friendly Fire Investigation Board to be the FACs decision to engage the A-10 on Charlie Company under Type 3 CAS control on his (the FAC's) authority. This was a direct violation of the Battalion Commander's standing order and the CAS Concept of Operations (CONOPS) for

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[68] "Results of Investigation into Death of U.S. Service Member." Globalsecurity.org. 8 November 2002. <http://www.globalsecurity.org/military/library/news/2002/11/mil-021108-centcom01.htm>. Accessed April 2006.

[69] Ibid.

Operation Iraqi Freedom that approval authority for Type 3 control of CAS assets rested only with the Battalion Commander. From the CONOPS:

> — Type 1 control requires the JTAC [Joint Terminal Attack Controller, also known as the FAC] to visually acquire the attacking aircraft and the target under attack. Type 1 is the default method of control.
>
> — Type 2 Control occurs when either visual acquisition of the attacking aircraft or the target at weapons release is not possible, or when attacking aircraft are not in a position to acquire the mark/target prior to weapons release/launch (night, adverse weather, high threat tactics, high altitude and standoff weapons employment).
>
> — Type 3 Control is used when the tactical risk assessment indicates that CAS attacks impose low risk of fratricide. When commanders authorize Type 3 control, JTACs grant a "blanket" weapons release clearance to an aircraft or flight attacking a target or targets which meet the prescribed restrictions set by the JTAC.[70]

FACs are required to broadcast the type of control in use upon aircraft check-in. The FAC in this incident recalled telling the pilots of the A-10 they would be operating under Type 3 control but neither pilot remembered hearing the call. It was the belief of the investigating board that the A-10 pilots in this incident thought they were under Type 2 control.

When this incident took place in 2003, JP 3-09.3, Joint Tactics, Techniques and Procedures for Joint Close Air Support, did not make any distinction between Type 1, Type 2 or Type 3 control of CAS assets. It stated that "aircraft check-in procedures are extremely important to the flow of information between airborne assets and control agencies."[71] The check in

[70] "Investigation of Suspected Friendly Fire Incident Near An Nasiriyah, Iraq, 23 March 03." Globalsecurity.org. 29 March 2004. <http://www.globalsecurity.org/military/library/report/2004/a-10-friendly-fire_centcom29mar2004.htm>. Accessed April 2006.

[71] United States. JP 3-09.3, 1995, V-1.

briefing format did not require the aircraft or the terminal controller to identify which type of control they were using. The standardized briefing form, the "Nine-Line Briefing" was used for all threat conditions though the mission information and sequence could be modified to fit the tactical situation. The eighth item in the nine-line brief is "location of friendlies". In this incident, the location of friendlies could not be ascertained due to communications problems between the Bravo Company Commander and Charlie Company. Based on the information available concerning the scheme of maneuver, the Bravo Company Commander believed his element to be the lead element and cleared the target ahead of him for fire. This incident of fratricide might have been avoided if the FAC attached to Bravo Company had followed the Battalion Commander's Standing Orders and requested approval authority for Type 3 control of the A-10s. He would have learned the location of the Charlie Company and would not have been given the authority to employ the A-10s under Type 3 control.

It is interesting to note that all the companies involved in this engagement had FACs attached with the exception of Charlie Company. Had Charlie Company had a FAC, this incident might have been avoided. It can be reasonably assumed that he either would have had control of the A-10s himself and could have relayed the position of Charlie Company, been monitoring the guard channel and heard the call for fire in his area and interjected or, at the very least, once the attack commenced, he could have called for an abort. According to JP 3-09.3, the FAC "controls CAS aircraft and maintains radio communications with assigned CAS aircraft from a forward ground position to aid target identification and reduce the potential for fratricide.[72] Charlie Company was the rear element of the 1st Battalion, 2nd Marines so it can be assumed that a FAC was not assigned to this company because the scheme of maneuver never had them in the lead.

By reviewing this incident, the practice in the field is being used as a baseline to determine if there were doctrinal deficiencies that hampered the

[72] United States. JP 3-09.3, 1995, II-12.

effective employment of JCAS. Did JP 3-09.3 provide the guidelines necessary for the effective employment of CAS? In this case, though the three types of aircraft control used in the employment of CAS were not yet defined by JP 3-09.3, they were defined by the CONOPS as well as the Battalion Commander's Standing Orders. Doctrine outlining the procedures to be used was promulgated and understood but miscommunications, confusion about the location of friendlies due to "fog of war" and lack of reliable communications links hampered the ability of the FAC, the Company Commanders and the Air Officer to effectively coordinate the CAS strikes.

JP 3-09.3 did not provide required guidelines to build the operational architecture necessary for effective CAS and those gaps were filled by the CAS CONOPS for Operation Iraqi Freedom using guidance from different sources including JP 3-09.3, USCENTCOM CONOPS for Joint Fires and the USCENTAF CAS CAO SOP. In September of 2005, a revision to JP 3-09.3 was issued. Some of the key changes incorporated into the revision included expanded guidance on the uses of CAS, updated conditions required for effective CAS, a detailed discussion on the three types of CAS terminal attack control and a discussion of urban CAS. An analysis of the changes will be discussed in the next section.

B. UPDATE OF JP 3-09.3

In September 2005, a revision of JP 3-09.3 was published, five years past its mandated revision date. This revision included numerous updates to incorporate new concepts and technologies and innovations that have been realized in training and combat operations, many of which likely stem directly from the three case studies previously discussed.[73] For the purposes of this paper, the following paragraphs will examine only those changes included in the updated JP 3-09.3 that relate to those case studies as well as the research questions identified in Chapter I.

[73] Michael W. Binney. "Joint Close Air Support in the Low Intensity Conflict." *Naval Postgraduate School (NPS)*. Monterey, CA. June 2003, 32.

The first change listed in the summary of changes to the updated JP 3-09.3 is a definition and discussion of the position of joint terminal attack controller (JTAC). In two of the three case studies examined earlier, the persons responsible for terminal control functions had a significant role in the outcome. In the original doctrine, the position of JTAC did not exist. The persons responsible for performing terminal control were forward air controllers (FACs), enlisted terminal attack controllers (ETACs) and forward air controllers (airborne) (FAC(A)s).

In the updated doctrine, a JTAC is defined as "a qualified (certified) Service member who, from a forward position, directs the action of combat aircraft engaged in CAS and other air operations. A qualified and current JTAC will be recognized across Department of Defense as capable and authorized to perform terminal attack control."[74] The position of JTAC incorporates the positions of ETAC and FAC into one. The 2003 JCAS Action plan listed the standardization of the JTAC position across the services as its second priority. This initiative resolves the conflict between the services over whose controllers can control JCAS assets.[75] By establishing the position of JTAC, extensive "talk-ons" directing the air asset to the target, can be avoided when terminal controllers from all services are trained the same and, consequently, are speaking the same language.

The updated JP 3-09.3 also provides a detailed discussion of JTAC to combat operations center/tactical operations center coordination. It highlights the necessity for JTACs and COC/TOC elements to coordinate their efforts prior to each CAS engagement, stressing issues such as types of terminal attack control in effect and which JTAC provides terminal attack control as key to the achievement of the supported commander's objective for CAS. The incidents in Afghanistan and Iraq both involved situations in which this coordination was ineffective. By providing a standard definition of the JTAC and outlining the

[74] United States, JP 3-09.3, 2005, I-2.

[75] Dahl, 7.

coordination process between the JTAC and the COC/TOC, the updated JP 3-09.3 offers improved guidance for the effective employment of CAS assets.

Another issue presented in the case study of the Marines at An-Nasiriyah was the confusion between the FAC and the A-10 pilot as to which type of terminal attack control they were operating under. The updated JP 3-09.3 provides a detailed discussion on the three types of CAS terminal attack control. The original publication did not. The advances in GPS-equipped aircraft and munitions, laser range finders and digital system capabilities have provided JTACs additional tools to maximize the effectiveness of CAS. Three types of terminal attack control have been identified to offer the lowest level supported commander the latitude to determine which type of control will best accomplish the mission. [76]

> **Type 1** control is used when the JTAC must visually acquire the attacking aircraft and the target for each attack. Analysis of attacking aircraft geometry is required to reduce the risk of the attack affecting friendly forces. Language barriers when controlling coalition aircraft, lack of confidence in a particular platform, ability to operate in adverse weather, or aircrew capability are all examples where visual means of terminal attack control may be the method of choice.
> **Type 2** control is used when the JTAC requires control of individual attacks and any or all of the following conditions exist: JTAC is unable to visually acquire the attacking aircraft at weapons release, JTAC is unable to visually acquire the target, the attacking aircraft is unable to acquire the mark/target prior to weapons release. Examples of when Type 2 control may be applicable are night, adverse weather, and high altitude or standoff weapons employment.
> **Type 3** control is used when the JTAC requires the ability to provide clearance for multiple attacks within a single engagement subject to specific attack restrictions. Like Type 1 and 2, only a JTAC can provide Type 3 control. During Type 3 control, JTACs provide attacking aircraft targeting restrictions (e.g., time, geographic boundaries, final attack heading, specific target set, etc.) and then grant a “blanket” weapons release clearance (“CLEARED TO ENGAGE”). Type 3 control does not require the JTAC to visually acquire the aircraft or the target; however, all targeting data must be coordinated through the supported

[76] United States, JP 3-09.3, 2005, V-14.

> commander's battle staff. The JTAC will monitor radio transmissions and other available digital information to maintain control of the engagement.[77]

Specific procedures for each type of control are outlined followed by step-by-step examples of how the type of control is conducted. Finally, the updated publication identifies the conditions in which each type of control is to be used and gives examples of situations in which each type of control may be applicable as well as emphasizing considerations for employing them. The JTAC is required to provide the type of control as part of the CAS brief. The guidance presented in the revised JP 3-09.3 is very specific with regard to the three types of terminal attack control and, if the procedures outlined are followed, leaves no room for confusion in the execution of terminal attack control.

Another change in the revision of JP 3-09.3 updates the conditions required for effective CAS. In the original publication, the conditions required for effective CAS were:

- Air Superiority
- Suppression of Enemy Air Defenses (SEAD)
- Target Marking
- Favorable Weather
- Prompt Response
- Aircrew and Terminal Controller Skill
- Appropriate Ordnance
- Communications
- Command and Control

In the updated version, the conditions required for effective CAS are:

- Effective Training and Proficiency
- Planning and Integration
- Command, Control and Communications
- Air Superiority
- Target Marking and Acquisition

[77] United States, JP 3-09.3, 2005, V-14-19.

— Streamlined and Flexible Procedures

— Appropriate Ordnance

— Favorable Weather

Many of the new conditions stem directly from incidents where CAS was ineffective and resulted in fratricide. In the case studies from Afghanistan and Iraq, lack of effective training and proficiency could have been a factor in each incident. JP 3-09.3 states that the "training should integrate all of the maneuver and fire support elements involved in executing CAS. Maintaining proficiency allows aircrew and JTACs to adapt to rapidly changing battlespace conditions." [78] In all three scenarios the battlespace changed rapidly and more effective training may have prevented the friendly fire incidents. Command, Control and Communications was a major factor in all of the case studies. According to JP 3-09.3:

> CAS requires an integrated, flexible C3 structure to identify requirements, request support, prioritize competing requirements, task units, move CAS forces to the target area, provide threat warning updates, enhance Combat Identification procedures, etc. Accordingly, C2 requires dependable and interoperable communications between aircrews, air control agencies, JTACs, ground forces, requesting commanders, and fire support agencies.[79]

In Kosovo, the C2 structure was ad hoc from the strategic down to the tactical level. In Afghanistan, the C2 structure was not flexible enough to identify requirements, request support or prioritize competing requests. Finally, in Iraq, communications were not dependable between the C2 players. Had this requirement been satisfied in any of the three cases, there would have been a better outcome. Streamlined and Flexible Procedures allow a commander to rapidly change targets, tactics or weapons in a dynamic battlefield. Techniques for improving responsiveness include using forward operating bases near the area of operations, placing aircrews in alert status and placing JTACs to facilitate continuous coordination with ground units, comms with aircraft and observation

[78] United States, JP 3-09.3, 2005, I-6.

[79] Ibid, I-7.

of enemy locations.[80] In Kosovo, targets and tactics were already changing rapidly. Had more streamlined and flexible procedures been in place, the situational awareness of the pilots conducting the strikes may have been heightened and the instances of targeting civilians might have been minimized.

The changes incorporated in the updated JP 3-09.3 represent significant steps forward in JCAS. This doctrine "presents options the joint force commander (JFC) can employ when planning and executing close air support in joint operations" and is authoritative. [81] Commanders must still provide additional directives to supplement the successful employment of CAS. The new version provides an improved guideline for commanders to frame their plans and procedures which, if implemented properly, will result in a more successful, wholly integrated joint force.

C. DOCTRINAL PROBLEMS

The case studies outlined above, along with the comparison of the updated JP 3-09.3 to the original version illustrate the need for further examination of Joint Close Air Support doctrine. Joint Forces Command has created J8, the Joint Requirements and Integration Directorate, to standardize training and procedures for JCAS along with other joint missions. The JCAS Executive Steering Committee (ESC) was created in October 2002 to resolve interservice issues. The JCAS ESC published a JCAS Action in 2003, incorporating fifteen action items to fix the shortfalls in service and joint training, equipment and the misapplication of JP 3-09.3.[82] These fifteen items were prioritized into tiers. The first five issues were:

1) Joint Task Analysis for JCAS
2) Joint Terminal Attack Controller (Ground)
3) Forward Air Controller-Airborne (FAC (A)) Standardization
4) Joint Integrated Training Plans
5) Live Sortie/Artillery Resource Plan[83]

[80] United States, JP 3-09.3, 2005, I-7.

[81] Ibid, i.

[82] Dahl, 5.

[83] Dahl, 5.

The five issues in the first tier were designated as a priority. Many of these issues have already been addressed. In 2005, the JTAC Memorandum of Agreement (MOA) was signed by the services as well as continuing the JCAS standardization progress by signing a JFAC MOA the same year. These two MOAs will standardize training and certification requirements for the five accredited schools training terminal attack controllers.[84] USJFCOM has also its Joint National Training Capability (JNTC) which simulates combat scenarios over an integrated network using virtual, live and constructive environments. The first of these integrated exercises leading to initial operating capability for JNTC focused on JCAS.[85]

USJFCOM directed the next five issues to be resolved as soon as feasible. These issues were:

6) Joint CAS Exercises
7) JCAS Training Simulation Support
8) Advanced JCAS Concepts Experimentation
9) Unmanned Air Vehicles (UAVs) in JCAS Operations
10) Integrated CAS Architectures and Interoperable JCAS Systems[86]

Progress has been made on several of these issues. In January 2004, the Western Range Complex JNTC Horizontal Training Event 04-1 was the first horizontal joint training exercise conducted throughout the United States, involving the participation of all four military services.[87] The event focused on JCAS, incorporating different services in the same scenario to interact with one another to achieve a common goal.[88] Three other integrated events in 2004 led to initial operating capability for JNTC.

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[84] Chris Hoffpauir, "USJFCOM Works to Standardize Joint Close Air Support." JFCOM.mil. 2 Aug 2005. <http://www.jfcom.mil/newslink/storyarchive/2005/pa080205.htm>. Accessed May 2006.

[85] Ibid.

[86] Dahl, 5.

[87] Jon Cupp. "Command Sponsors First JNTC Training Exercise." JFCOM.mil. 9 January 2004. < http://www.jfcom.mil/newslink/storyarchive/2004/pa010904b.htm>. Accessed May 2006.

[88] Cupp.

Armed UAVs have already been used in direct support of troops on the ground and, as their technology matures, they may prove to be a vital element in the CAS mission area. Joint Close Air Support architecture has been updated in the revised version of JP 3-09.3 to reflect the changes that emerged from operations in Iraq and Afghanistan. Joint Battle Management Command and Control (JBMC2) is currently in development to provide a baseline JTF HQ Core architecture against which JTF Functional Component Commanders (FCC) can map their own views.[89] The Joint Tactical Radio System (JTRS) is an Army led program fielding a software programmable radio system, compatible in units across the services.[90] Initial deliveries of the radios is expected in 2008.

Despite the progress made by JFCOM and the JCAS ESC, problems continue to exist with JCAS doctrine. JP 3-09.3 provides a guideline for the operational architecture necessary for effective CAS. Commanders often do not like to adhere to doctrine because great respect is given to leaders who are agile in combat.[91] Because of the authoritative rather than directive nature of doctrine, tacticians often deviate from doctrine based on approval by the commander.[92] Joint doctrine accounts for what we know and should be used as a guideline when planning joint missions. Is the doctrine written in such a way as to be useful? Is it clear enough as to where to get needed guidance? These two questions can be debated. What is clear is that, until all forces and services understand and adhere to the same doctrine, we will continue to experience mistakes on the battlefield.

To utilize JP 3-09.3 as an effective process model, forces must understand that doctrine is the standard required for effective training, management and support. Individuals bring specific experience and expertise to the watch floor but the tactics, techniques and procedures outlined in doctrine will

[89] Kenneth Williams. "Joint Battle Management Command and Control." U.S. Joint Forces Command. 14 June 2005. < http://www.dtc.army.mil/tts/2005/proceed/williams/Williams.pdf>. Accessed May 2006.

[90] Dahl. 9.

[91] John M. Jansen, et al. "The Tower of Babel: Joint Close Air Support Performance at the Operational Level." Marine Corps Gazette. March 2003.

[92] Ibid.

provide a baseline for effective operations. Doctrine also provides a structure for measurement of the effectiveness of our operations. If we are not adhering to that doctrine and are using ad hoc procedures on the battlefield, we will be unable to improve existing doctrine and learn from our mistakes. Finally, doctrine takes time and effort to produce. Often doctrine does not keep pace with emerging technology however, its guidelines provide enough flexibility for the commander to deviate from it, depending on the circumstances. When forces have a firm grasp on doctrine, they are able to incorporate those deviations yet adhere to the basic tenets of the doctrine. The key to effective JCAS is the C2 architecture from the top to the bottom. Effective, network-centric joint communications systems must be developed and incorporated into this architecture. Until then, all services must use the tactics, techniques and procedures outlined in JP 3-09.3 as their guideline when conducting close air support in a joint environment. Figure 5 shows the current JCAS connectivity.

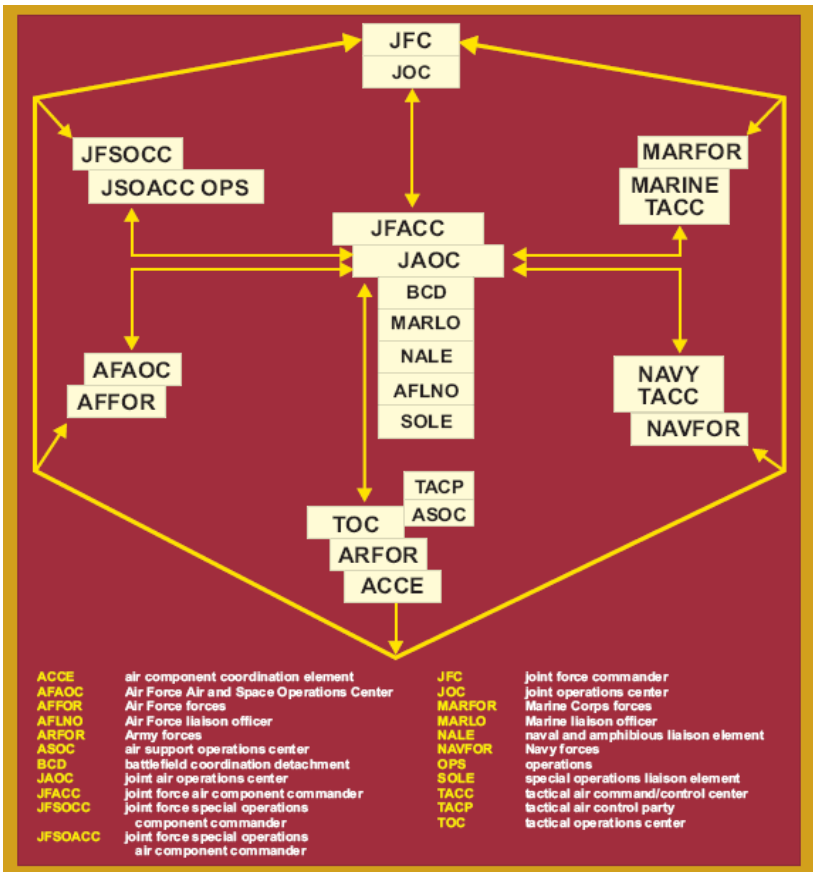

Figure 5. Joint Force Close Air Support Connectivity (From JP 3-09.3)

D. CONCLUSION

The integration of Joint Close Air Support has sometimes been called the most difficult joint mission. Different services' components, aircraft, forces and fires are all coming together to fight a close ground battle.[93] Because of this difficulty, successful trusting relationships at all levels in this detailed process are extremely important. The Command and Control Tenets listed in Joint Pub 0-2, Unified Action Armed Forces (UNAAF) serve as a framework for developing joint doctrinal concepts. They are:

- Clearly Defined Authorities, Roles and Relationships
- Information Management
- Implicit Communication
- Timely Decisionmaking
- Robust Integration, Synchronization, and Coordination Measures
- Battle Rhythm Discipline
- Responsive, Interoperable Support Systems
- Situational Awareness
- Mutual Trust[94]

Many of these problems encountered in the case studies outlined above are in direct conflict with these tenets. In the Kosovo conflict, authorities, roles and relationships were not clearly defined, leading to delays in timely decision making and a lack of mutual trust between decisionmakers. In the incident in Afghanistan, there was a lack of implicit communication and situational awareness. Finally, problems with information management coupled with coordination measures that were lacking and deficient situational awareness led to the tragedy in Iraq. The original Joint Doctrine for CAS, used over the last ten years, did not address most of these tenets. The revised version has come a long way in identifying shortfalls and making corrections to them, enhancing our ability to fight as an effective joint force. The doctrine will never be perfect, but it

[93] Dahl, 1.

[94] United States. Joint Chiefs of Staff (JCS). JP 0-2 Unified Action Armed Forces (UNAAF). Washington: GPO, 2001.

accounts for what we know and as a guideline, it lays the groundwork for successful integration of forces at all levels.

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IV. FUTURE WEAPONS AND INTEGRATION OF NSFS INTO JCAS

As the joint battlespace becomes more complex and weapons systems continue to advance, fire support from surface ships may become a requirement for the successful sustainment of forces operating ashore. Naval Surface Fire Support (NSFS) is defined by JP 1-02, Department of Defense Dictionary of Military and Associated Terms, as "fire provided by Navy surface gun, missile, and electronic warfare systems in support of a unit or units tasked with achieving the commander's objectives." JP 3-02, Joint Doctrine for Amphibious Operations, characterizes the primary mission of NSFS as destroying enemy forces at a defended landing beach as well as isolating a landing area to weaken coastal defenses. NSFS has been an integral component of U.S. littoral and amphibious operations since the Iowa class battleships were introduced during WWII. The twenty-four mile range of their 16-inch guns coupled with their thick armor gave these battleships increased survivability in high-threat operations.[95] With the decommissioning of the last Iowa-class battleship in 1992, a void was left in NSFS capabilities. In 1994, the Navy developed a two-phased plan to field a replacement NSFS capability. "In the near-term to midterm, it would modify the capability of 5-inch guns on existing destroyers and cruisers, and develop extended-range guided munitions for the modified 5-inch gun. In the far term, it would field a sufficient number of new destroyers fitted with an even-longer-range advanced gun system and ultimately a very-long-range electromagnetic gun or 'Rail Gun.'"[96] In this chapter, NSFS and future NSFS weapons systems will be examined to determine their contribution to the JCAS mission area.

As stated above, NSFS is an integral component of littoral and amphibious operations. Eighty percent of the world's capital cities are located in the littorals, along with three-quarters of the world's population. The 2004 draft of the Major Combat Operations Joint Operating Concept stresses urban warfare as a key

[95] United States. General Accounting Office. Options for NSFS. (Washington: GAO, 2004) 1.

[96] Ibid, 1.

battlefield in future combat operations and assumes that we will face enemies who operate outside the rule of law and are difficult to distinguish from non-combatants.[97]

Because more than three-quarters of the world's urban areas are located in the littorals, it is reasonable to assume that Naval Surface Fire Support will contribute significantly to these combat operations. The decommissioning of all Iowa-class battleships left a significant gap in our NSFS capability. The thirteen-mile range of the MK 45 5-inch/54-caliber gun is insufficient to provide effective fire support for the initial stages of amphibious operations. The Navy is currently working with the Marine Corps to address the overall capabilities needed for NSFS.[98] A major hurdle with developing systems for NSFS is cost. The time, money and modernization costs associated with reactivating battleships is not feasible. The fielding of the Extended Range Guided Munition (ERGM) system for use in upgraded 5-inch guns on current destroyers and cruisers has been delayed, as has the fielding of an advanced gun system for the new DD(X) destroyer.[99] Finally, a sufficient number of DD(X) destroyers to close the NSFS gap will not be available until 2018.[100]

Despite these drawbacks, recent Navy analysis found that surface combatants are still the best gapfiller during the early stages of an amphibious operation based on:

- Immature theater
- Lack of air superiority
- Capacity
- Number of people placed in danger
- All weather

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[97] United States. Department of Defense. Major Combat Operations Joint Operating Concept, Version 1.10. (Washington: GPO, 2004),64.

[98] United States. Options for NSFS, 3.

[99] Ibid, 4-5.

[100] Ibid.

— Capability (24 hours/7 days per week)

— Cost [101]

As a result, the Navy must continue to fund research and programs that will produce the capabilities required for effective NSFS in the near term.

A. NSFS WEAPONS SYSTEMS

For Naval Surface Fires to remain a relevant component of amphibious and littoral operations, programs and systems currently under development must proceed as planned and remain on schedule. This section will discuss the NSFS systems and platforms currently in progress that will help close the existing gap in NSFS capability.

The Tomahawk land attack missile is an all-weather ship-launched missile capable of attacking a variety of fixed targets in a high-threat environment. The Tomahawk uses a variety of systems for guidance including GPS, terrain contour matching (TERCOM) and digital scene matching area correlation (DSMAC), providing the surface Navy a proven deep-strike weapon capable of pinpoint accuracy.[102] An upgrade to the Tomahawk land attack missile is the Tactical Tomahawk, an improvement that allows the weapon system to be an element of the network-centric force envisioned by the Pentagon.[103]

The Tactical Tomahawk, developed by Raytheon, is the only naval surface weapon that may provide a near-term capability for surface ships to contribute to the JCAS mission area. It uses its connectivity to multiple sources including UAVs, satellites, soldiers, aircraft, tanks and ships to find its target and is able to send data back and forth between the platforms. The updated missile is capable of reprogramming in mid-flight and redirecting to one of 16 pre-designated targets or any other GPS coordinate up to 1000 miles from its firing unit. Its long

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[101] United States. Options for NSFS, 28.

[102] "BGM-109 Tomahawk." Federation of American Scientists. 1 December 2005. <http://www.fas.org/man/dod-101/sys/smart/bgm-109.htm>. Accessed May 2006.

[103] "BGM-109 Tomahawk." Wikipedia.org. 2 May 2006. <http://en.wikipedia.org/wiki/Tomahawk_Land_Attack_Missile>. Accessed May 2006.

loiter time and on-board TV camera provide it the ability to perform battle damage assessment and send data back to commanders. [104]

The Tactical Tomahawk entered service in 2004 with initial production expected to be completed by December 2006. The Navy awarded Raytheon a 5-year contract, worth up to $1.2 billion to replenish the Tomahawk inventory. The Block IV missiles cost approximately half the price of the Block III variant and will have a fifteen-year warranty and recertification cycle, compared with the eight-year warranty and recertification cycle for the Block III.[105] The updated Tactical Tomahawk Weapons Control System (TTWCS) will be employed on cruisers, destroyers and submarines, allowing commanders the mission planning function aboard the firing unit. This ability will reduce the weapon system reaction time by speeding up the tactical mission planning process.[106] The rapid mission planning process coupled with the long loiter time over the target area are two key factors that will allow the Tactical Tomahawk to make a significant contribution to the Joint Close Air Support mission.

Another surface fires technology currently under development is the Extended Range Guided Munition (ERGM). The ERGM is a 5-inch, rocket-assisted, high energy propelling charge shot from a MK 45 Mod 4, 5-inch/62-caliber gun. The MK 45 5-inch gun will be able to fire all conventional 5-inch ammunition in the current inventory. The ERGM provides Navy surface ships with a precision strike capability from a range of up to sixty-three NM, allowing them to contribute to expeditionary operations and the Joint land battle. The

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[104] "BGM-109 Tomahawk." Wikipedia.org. 2 May 2006. <http://en.wikipedia.org/wiki/Tomahawk_Land_Attack_Missile>. Accessed May 2006.

[105] "Raytheon Awarded Tomahawk Block IV Full-Rate Production Contract." PRNewswire.com. 18 August 2004. <http://www.prnewswire.com/cgi-bin/stories.pl?ACCT=104&STORY=/www/story/08-18-2004/0002234457&EDATE=>. Accessed May 2006.

[106] Marcus Urioste. "Tomahawk Cruise Missile Control: Providing the Right Tools to the Warfighter." STSC Crosstalk. September 2004. <http://www.stsc.hill.af.mil/crosstalk/2004/09/0409Urioste.html>. Accessed May 2006.

projectile uses GPS/INS for guidance that is resistant to jamming, allowing the round to function in a heavy electronic countermeasure environment.[107]

The ERGM program began in 1994, with the first projectiles scheduled to enter service in early 2005. Though several successful flight tests have been conducted, difficulties with the guidance system, design, motor and gun barrel as well as contract modifications have delayed the fielding of the system until 2011, ten years later than originally planned. The ERGM system will be employed on Arleigh-Burke-class destroyers, starting with DDG-81, the USS Winston S. Churchill, as well as possibly modifying Ticonderoga-class cruisers with the new gun, though no money has been appropriated for this conversion. If this program is to significantly contribute to the NSFS mission and subsequently the Joint Close Air Support Mission significant progress will need to be made in fielding this system. The setbacks and delays experienced by this program have left a significant gap in our surface fires capability for at least the next five years.

The retirement of the battleships left a void in our surface fires capability. To fill that void, the Navy is fielding the DD(X), a future class of destroyers with a mission focus on land attack. The DD(X) will feature a variety of new systems tailored for the NSFS mission. First, an integrated power system will provide power for propulsion, ship services and weapons systems from the same electrical source, allowing large amounts of power to be reallocated to combat systems.[108] Future weapons systems such as electromagnetic rail guns would be able to use that power to fire at targets with ranges of over 200 miles, using GPS guided projectiles at six times the speed of sound. Rail gun rounds could provide missile-like capabilities without requiring powders or magazines at a much lower cost than a missile such as the Tomahawk land-attack missile or the Tactical Tomahawk.[109] One analysis compared the 200-mile volume of fires

[107] "EX-171 ERGM Extended-Range Guided Munition." Globalsecurity.org. 3 January 2006. <http://globalsecurity.org/military/systems/munitions/ergm.htm>. Accessed May 2006.

[108] "DDG-1000 Zumwalt/DD(X) Multi-Mission Surface Combatant." Globalsecurity.org. 1 May 2006. <http://www.globalsecurity.org/military/systems/ship/dd-x.htm>. Accessed May 2006.

[109] "Not Your Grandpa's Shootin' Iron: Rail Guns." Military.com. 2004. <http://www.military.com/soldiertech/0,14632,Soldiertech_RailGuns,,00.html>. Accessed May 2006.

capability of a single hypersonic naval rail gun to the ordnance delivery capacity of a carrier air wing of F/A 18s and found that in the first eight hours of conflict, a single rail gun could deliver twice the payload and three times the energy to ten times as many fixed aim points as carrier aviation.[110] This capacity would enable the rail gun and NSFS to be a relevant participant in Joint Close Air Support. A Mach 7 rail gun could deliver a payload 100 NM in approximately 2 minutes.[111] The most significant challenges to the development of large-scale rail gun technology are the gouging and wear that occur during the acceleration phase of the projectiles to hypervelocities as well as the development of electric support systems capable of meeting the power requirements of more than 60 megawatts.[112] This technology is currently under development and may be fielded as early as 2011.

To support its primary mission of land attack, the DD(X) will have two Advanced Gun Systems (AGS). The AGS is 155mm caliber gun mounted within a conventional turret arrangement. The turret allows for the entire 62-caliber length barrel to be enclosed inside the turret housing when not firing. Ammunition supply and operation will be fully automated.[113] The AGS will use a rocket-assisted Long Range Land Attack Projectile (LRLAP), a highly accurate, GPS-guided munition with a range of up to 100 NM. The AGS will have a multiple round simultaneous impact capability that will allow multiple rounds to be fired simultaneously at targets up to 75 percent of the guns maximum range. The payload of the LRLAP will be 3 times that of the ERGM.[114] Currently the AGS is

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[110] Naval Warfare Concept Team Reports, VI-9, cited by David Adams, "Naval Rail Guns Are Revolutionary." Edusworld.org. 2004. <http://edusworld.org/ew/ficheros/2004/railguns.pdf>. Accessed May 2006.

[111] David Adams. "Naval Rail Guns Are Revolutionary." Edusworld.org. 2004. <http://edusworld.org/ew/ficheros/2004/railguns.pdf>. Accessed May 2006.

[112] Adams.

[113] "Advanced Gun System." Wikipedia.org. 28 April 2006. <http://en.wikipedia.org/wiki/Advanced_Gun_System>. Accessed May 2006.

[114] Edward Lundquist. "Advanced Gun System for DD-X To Expand Commander's Options." NationalDefenseMagazine.org. June 2003. <http://www.nationaldefensemagazine.org/issues/2003/Jun/Advanced_Gun.htm>. Accessed May 2006.

only scheduled for installation on the DD(X) and no plans have been made to retrofit current ship designs with the new gun. [115]

Finally, to execute these fire support options, current Naval surface platforms as well as DD(X) will use the Naval Fires Control System (NFCS). "NFCS will automate shipboard land-attack battle-management duties and incorporate improved land-attack battlefield digitization. NFCS will be interoperable with joint C4ISR systems, providing the mission planning and fire-support coordination functions needed to support the extended ranges and precision-strike and accuracy capabilities mandated for new fire support systems."[116] Lockheed Martin has been awarded a contract to integrate the Tactical Tomahawk Weapons Control System, the Land-Attack Missile Fire Control System and Naval Fires Control System into one component called TLN (Tomahawk/Land/Naval). This C4I system will be interoperable with the Army and Marine Corp's Advanced Field Artillery Tactical Data System (AFATDS) and the Air Force's Theater Battle Management Core System through the Automated Deep Operations Coordination System (ADOCS) to provide real-time situational awareness in a net-centric environment across the entire joint force.[117]

Unmanned Aerial Vehicles (UAVs) have the potential to make a significant contribution to the CAS mission. Currently they are used primarily by the Navy for surveillance and intelligence gathering, although recently have provided direct support for troops on the ground in theaters such as Afghanistan and Iraq. The first use of an armed UAV outside a major combat theater was in 2002, when a CIA-controlled Predator firing a Hellfire missile was used to kill six Al-Qaeda

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[115] Edward Lundquist. "Advanced Gun System for DD-X To Expand Commander's Options." NationalDefenseMagazine.org. June 2003. <http://www.nationaldefensemagazine.org/issues/2003/Jun/Advanced_Gun.htm>. Accessed May 2006.

[116] Stephen H. Keller. "Naval Surface Fire Support: On Target." NavyLeague.org. September 2001. <http://www.navyleague.org/seapower_mag/sept2001/naval_surface_fire_support.htm>. Accessed May 2006.

[117] Jon Cupp. "Command Gains Insights from First Joint Fires Initiative Limited-Objective Experiment." JFCOM.mil. 29 October 2004. <http://www.jfcom.mil/cgi-bin/perlfect/search/search.pl?q=naval%20fires%20control%20system&showurl=%2Fnewslink%2Fstoryarchive%2F2004%2Fpal02904.htm>. Accessed May 2006.

terrorists in Yemen.[118] The armed UAV brings many advantages to today's battlefield. First, they are able to provide up to 10 hours of endurance from ranges of up to 1,000 nautical miles.[119] Second, they have sensors allowing for the detection and cataloging of targets for attack by other platforms during all-weather conditions.[120] Finally, the UAVs ability to accelerate to "fighter-like" speeds provide rapid responsiveness.[121] The Navy is currently working in conjunction with the Air Force on the Joint Unmanned Combat Air Systems program (J-UCAS). "The objective of the J-UCAS program is to develop, demonstrate and transition an affordable, lethal, survivable, and supportable unmanned combat air system to meet the operational needs of the Air Force and Navy."[122] This system is scheduled to have its first flight in May of 2007. If this technology stays on track and on schedule, UAVs may fill the gap in surface fire support sooner than any other Naval surface weapon.

B. OUTLOOK FOR NAVAL WEAPONS INTEGRATION INTO JCAS

As stated above, the Navy is lagging in its development of effective surface fire support systems. With the void left by the decommissioning of the Iowa-class battleships, Navy surface ships currently do not have the capability to contribute much to the land battle. The near to mid-term solution of a modified 5-inch gun capable of firing extended range guided munitions has been delayed until 2011. The far-term solution of fielding a sufficient number of DD(X) destroyers to close the gap left by the battleships will not be realized until at least 2018.

To satisfy this requirement now, the Tactical Tomahawk and the armed UAV may be the best option for the Navy if it is to remain a relevant element of the joint battlefield. With the Tactical Tomahawk's all-weather capability as well

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[118] "RQ-1 Predator MAE UAV" Federation of American Scientists. 6 November 2002. < http://www.fas.org/irp/program/collect/predator.htm>. Accessed May 2006.

[119] Jay Stout. "Close Air Support Using Armed UAVs?" Military.com. July 2005. <http://www.military.com/NewContent/0,13190,NI_0705_Air-P1,00.html>. Accessed May 2006.

[120] Stout.

[121] Ibid.

[122] "Joint Unmanned Combat Air Systems Program Transitioning to the Services." DARPA.mil. 26 October 2005. <http://www.darpa.mil/j-ucas/>. Accessed May 2006.

as its ability to be programmed with up to sixteen GPS targets make it an excellent option for support to forces on the ground. Its long loiter time and connectivity with a number of different platforms give commanders options in a fast-paced, changing battlespace. The relatively low cost of the TacTom make it a realistic option for future use in JCAS. If the Tactical Tomahawk is to become a viable option in the JCAS mission area, airspace issues will need to be addressed in JCAS doctrine. Currently, there is no mention of the Tactical Tomahawk in JP 3-09.3 but if it is to be used, it must be incorporated into the planning phase of JCAS, taking into account such things as time of day, weather conditions, terrain, communications and other CAS assets available. Depending on these factors, the Tactical Tomahawk may prove to be a viable option for troops on the ground.

Along with the Tactical Tomahawk, the armed UAV is the only other system that will allow the surface Navy to contribute to the land battle in the near term. It is scheduled to be operational within the next five years. Its ability to act as a reliable sensing platform, its high speeds and long loiter time are crucial for the network-centric force of the future. J-UCAVs will not only be able to provide support to the warfighter through information relays, real-time video and laser designating capability but also provide direct support to troops on the ground with payloads of up to 20 small diameter bombs.[123] JP 3-09.3 discusses UAVs but only in the context of airspace deconfliction, providing surveillance and target designation. There is no mention of UAVs as a combat aircraft so future iterations of JP 3-09.3 may need to include them as an execution aircraft rather than simply a support platform.

Within the next ten years, when the NSFS gap is filled, it will be necessary for the revision of JP 3-09.3 to incorporate naval surface fires into joint CAS doctrine. JTAC training and education will need to be revised to include calling in support from naval surface vessels. When Extended Range Guided Munitions, the Advanced Gun System, rail guns and Tactical Tomahawk become a reality

[123] Stout.

on surface ships, issues such as terminal attack control procedures, airspace deconfliction and planning considerations must be addressed. NSFS will most likely be included in the deliberate planning phase and key concepts to consider will be: commander's intent, terrain, location of the enemy and the timeliness, accuracy, mass, flexibility and desired effects of the weapon. If these conditions can be satisfied reliably by a naval surface weapons system, NSFS will have re-acquired its place as part of the larger land battle.

To integrate NSFS into the JCAS architecture, future iterations of JCAS doctrine must provide a flexible yet standard process in which to incorporate surface fires. The key to successful integration will be a reliable, network-centric C2 architecture for communications between all pertinent joint elements. This communications architecture will provide the basis for successful execution of the JCAS mission. Devices that connect ground, air and surface forces with the same picture and allow them to share photos, images and electric pen markings in near real time will be important tools for effectively employing close air support from any platform.[124] Once forces are able to reliably communicate regardless of service, platform or location, the integration of NSFS into this architecture could potentially be seamless.

[124] Pappalardo.

V. CONCLUSIONS AND RECOMMENDATIONS

Historically, the integration of Close Air Support has been difficult. Differences of opinion in the application of air power in support of forces on the ground have been prevalent since the first U.S. aircraft dropped bombs against enemy fortifications in the closing battles of World War I. The Air Force has traditionally viewed Close Air Support as a strategic instrument of force while the Army has traditionally viewed it as a tactical one. These differences have been at the heart of the problem of successfully integrating the CAS mission. The need for relevant, integrated doctrine has never been greater than it is today.

The National Military Strategy has placed a priority on fighting as a joint force and identifies a fully integrated, agile and decisive force as one of our most desired attributes. With the battlefield changing from large, conventional war to small, urban battles, specialized units using CAS for their heavy fire power will be the standard fighting force. With budget cuts, attrition and the short turnaround in deployment cycles, there is no place in current CAS doctrine for service bias. It is important that the services pay close attention to joint doctrine because of its increasingly authoritative nature. All services must participate in the joint debate and doctrine must be in the best interests of integrating them into one fighting force and not become a power struggle between them. JCAS must be linked to the larger land battle and JCAS doctrine must be tailored to “grow” with emerging technologies and weapons systems. Future doctrine must be updated to include Naval Surface Fire Support capabilities and the development of the Joint Tactical Radio System must be monitored to ensure the seamless transition to an effective, net-centric force. Devices that connect all forces with the same picture and allow them to share photos, images and electronic pen markings in near real time will be important tools for effectively employing close air support and an important addition to future joint doctrine.[125]

[125] Pappalardo.

By studying incidents in which JCAS was used ineffectively, themes which hamper our ability to effectively employ CAS have been identified. The inability of leaders to agree on target selection in the planning phase or to simply consider the conditions for effective CAS listed in JP 3-09.3 were the primary themes that contributed to the targeting of civilians on Djakovica-Prizren Road in Kosovo. An ineffective C2 architecture was the primary theme the led to the fratricide of CWO2 Stanley Harriman in the Shahikot Valley in Afghanistan. Finally, lack of situational awareness, confusion over the type of terminal control in which they were operating as well as communications problems were the themes contributing to the fratricide of at least ten U.S. Marines in An Nasiriyah, Iraq in 2003. By examining these case studies and identifying these themes, a foundation can be laid for the revision and implementation of future JCAS doctrine.

In the future, combat operations will be more complex and the successful, detailed integration of JCAS within the services will be crucial. If doctrine is to keep pace with technology, it must remain flexible yet relevant. Areas of future study of JCAS doctrine will need to identify the limitations of urban battlespace, as urban warfare will be our primary battlefield. Current doctrine addresses the urban CAS environment but only to provide very general guidance on target acquisition, munition effects, terminal attack control and Supression of Enemy Air Defenses requirements. Command and Control architecture in an urban environment will need to be specifically addressed because of the limitations imposed upon communications in metropolitan areas, a problem highlighted in the incident in An Nasiriyah. The revised JP 3-09.3 discusses C2 in urban terrain but simply states that “a detailed, flexible and redundant C2 plan is essential.”[126] For the doctrine to be effective, more detailed guidance must be given for the creation of that detailed, flexible and redundant C2 plan.

Another area of future study will need to be the integration of future smart weapons and UCAVs into joint doctrine. Currently, UAVs are identified as

[126] United States, JP 3-09.3, 2005, V-48.

surveillance and intelligence platforms but in the future, may be a primary provider of CAS to forces on the ground. Terminal attack control procedures for these UCAVs will need to be addressed as well as methods in which to identify friendlies. Weapons such as the Tactical Tomahawk will need to be incorporated into the tactics, techniques and procedures for CAS when ground troops are able to program in target coordinates to redirect the weapon to their desired targets. There are no terminal attack control procedures currently outlined for this type of control and it is something that will need to be addressed once the Tactical Tomahawk is fully operational on the battlefield.

Finally, history has shown that we are not good at documenting and implementing lessons learned. Future study in the development of a joint system for tracking and implementing lessons learned, contributed by any member of the process from the lowest echelons to the highest, may be useful in developing future doctrine. Such a system would store lessons learned in a common, joint database, available in a simple, standard format to those charged with revising doctrine, making the process much less complicated. The revision of JP 3-09.3 was approved in September 2005, ten years after the original doctrine was released and five years after the first revision was mandated. A system for documenting lessons learned would ensure the timeliness and relevancy of future revisions.

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